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THE INFLATIONARY IMPACT OF TRADITIONAL ANTI-INFLATIONARY MONETARY POLICIES

by JOSEPH W. MCGUIRE

College of Business Administration, University of Washington

In recent years economic opinion, as expressed in articles and books on central banking and monetary policy, has appeared to be disposed ever more favorably toward the employment of traditional monetary instruments for curtailing inflationary tendencies. The belief that these devices can halt inflation has, of course, been widely held for several decades, although in the past critics have frequently attacked specific increases in discount rates, or certain sales of securities on the open-market, or instances where reserve requirements have been raised; claiming that such adjustments have been too harsh, or badly timed. Rarely, however, has the basic anti-inflationary nature of these measures been critically examined. 1) Thus, while the results of restrictive monetary policies have often been censured in practice, their theoretical propriety has remained relatively sacrosanct. In fact, it has appeared to be one of the immutable laws of central banking that inflation can be halted by the appropriate utilization of one or more traditional anti-inflationary monetary instruments.

It is with some apprehension, therefore, in the light of the widespread economic approval of traditional credit restraints, that the central theme of this article is advanced. Nevertheless, it seems that certain developments in economic theory indicate that a case can be put forward wherein the results of anti-inflationary monetary policies prove to be inflationary, at least in the short-run.

This then, is the task of this article: to illustrate how, under certain assumptions, the restriction of credit by traditional methods may result in further inflation. The structure of the argument used to arrive at this conclusion is organized in the following manner: First, the traditional position on the effectiveness of deflationary monetary

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1) A few of the articles that have critically treated anti-inflationary monetary policies have been: M. Friedman, "A Monetary and Fiscal Framework for Economic Stability", *American Economic Review*, June, 1948, XXXVIII; G. L. Bach, "Monetary-Fiscal Policy Reconsidered", *Journal of Political Economy*, October, 1949, LVII, and; W. L. Smith, "On the Effectiveness of Monetary Policy", *American Economic Review*, September, 1956, XLVI.

polices is established. Those developments selected from current economic theory are then set forth. Finally, monetary policy and economic theory are blended to produce the conditions under which anti-inflationary policies may have inflationary consequences.

I

For several decades the Federal Reserve authorities have stressed the effects of anti-inflationary monetary policies upon bank reserves and the money supply. This emphasis has been modified in recent years, and now corresponds quite satisfactorily with the current fashionable trend in monetary analysis, which is to stress the effects of credit restrictions upon the supply of, rather than the demand for, funds. ²) Some postwar critics of the Federal Reserve System have argued that structural changes in the monetary system necessitate even greater readjustments in traditional Federal Reserve attitudes, for institutions other than commercial banks have become extremely important in money markets in the last decade. ³) Other critics have claimed that changes in velocity and shifts within the money supply are of great significance in moderating the influence of monetary policies, and should be taken into account by the Federal Reserve. ⁴) Despite these criticisms, there appears to be general agreement that the imposition of additional Federal Reserve controls *does* affect adversely bank reserves and the loaning policies of other financial institutions, and *does* tend to tighten the supply of credit.

When the Federal Reserve sells securities on the open-market, raises discount rates, or increases reserve requirements, banking institutions are affected by these moves. An increase in rates, for example, may result in an extensive curbing of the rate of expension of bank credit if banks are heavily in debt to the Federal Reserve. On the other hand, such increases may have only psychological effects upon the banking community when the market is easy. Even

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²) As an example of the current fashinon, see: *Money, Trade, and Economic Growth: In Honor of John Henry Williams*, essay by R. V. Roosa, "Interest Rates and the Central Bank", (New York: The Macmillan Company, 1951). As an illustration of the change in Federal Reserve attitudes, contrast the 1947 and 1954 editions of: Board of Governors of the Federal Reserve System, *The Federal Reserve System: Purposes and Functions* (Washington: Board of Governors); especially see Chapter IX in the 1954 edition.

³) J. G. Gurley and E. S. Shaw, "Financial Aspect of Economic Developments", *American Economic Review*, September, 1955, LXV, 515—538.

⁴) Smith, *op. cit.*, pp. 588—606.

when of minor importance, however, increases in rates do affect, at least slightly, the willingness of commercial banks to expand credit. When combined with open-market sales, increases in rates are still more effective. The sale of securities on the open-market ordinarily will result in an increase of member bank indebtedness, which may cause these institutions to be less able, or less willing, to expand or renew loans, and will therefore discourage the expansion of deposits. Upward changes in reserve requirements, which are more harsh but less frequently resorted to by Federal Reserve authorities, affect the reserves and liquidity positions of commercial banks, and thus tend to dampen the expansion of bank credit.

The import of traditional Federal Reserve credit controls lies not only in their effects upon member banks and other financial institutions, however, for these enterprises may be considered mainly as transmitters of credit tightness. Nor does their import reside only in the impact of these measures on the money supply, for the supply must be related to the economic activity. To examine the inflationary process, as well the Federal Reserve efforts to halt it, the "veil of money" must be lifted, and economic results of anti-inflationary policies must be scrutinized. The hallmark of inflation is a rise in prices. The cause of inflation (not necessarily basic) is the excess of aggregate demand over aggregate supply. Therefore, this analysis must extend beyond the effects of anti-inflationary actions on the money supply alone, and move to the productive economy where traditionally it has been claimed that monetary policy is restrictive because it tends to contain the expansion of aggregate demand.

The private sector of aggregate demand often has been separated into investment and consumer expenditures. It is generally stated that the initial effects of anti-inflationary policies as transmitted by lenders are impressed primarily and most strongly upon investment. 5) The reactions of consumer spending to changes in monetary

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5) For example, Wm. McChesney Martin, Jr., Chairman of the Board of Governors of the Federal Reserve System, in his statement before the Committee on Finance of the U.S. Senate, August 13, 1957, reprinted in the *Federal Reserve Bulletin*, August, 1957 under the title "Winning the Battle Against Inflation" said: "While the effect of a moderate change in interest rates on the cost of goods currently being produced and sold is small and relatively unimportant, changes in interest rates do assume importance as a cost in the planning of new investment outlays... They do tend to deter the undertaking of new investment projects and to keep the amount of investment spending that is being undertaken in line with the economy's ability to produce investment goods". pp. 874—875.

policies are largely of a secondary nature, and occur because of investment and income changes. The staff of the Board of Governors has summed up this result by noting that: "The mechanism of credit tightness and of related increases in interest rates counteracts unsound business booms to a large extent by curbing the pace of investment." [6]) The initial impact of credit tightness upon consumer borrowing, on the other hand, appears to be relatively negligible. [7]) The direct, immediate effects upon consumption are not certain, although it is agreed that this spending will eventually decline as (or if) income falls. [8])

Investment is affected most significantly in two ways by the imposition of monetary controls. First, through an increase in rates, "marginal" or "fringe" borrowers, who would have borrowed funds to finance additional capacity or changes in inventories, are deterred from borrowing. [9]) There are always fringe borrowers in the market, although at times this fringe may be quite limited, as in inflationary periods when profit expectations in general are exceedingly high, or in times of depression, when the marginal efficiency of capital schedule has fallen to extremely low levels. [10]) Second, through the process of credit tightening, firms are discouraged from resorting to the market for long-term funds. It is difficult for businesses to issue new securities in a period of rising rates, and most firms postpone new issues until rates are stabilized. [11])

When the Federal Reserve authorities tighten credit conditions it is not typically their objective to bring about an absolute reduction in income, investment, and consumption; but rather to slow the pace of aggregate demand to rates that conform more closely with a healthy growth of aggregate supply. The efforts to attain this goal can be observed by examining the usual manner in which monetary operations have been conducted in the past. Changes in discount rates, for example, have ordinarily been rather small. Open market operations have been carried out gently, as a rule, and the Federal Reserve has been ready to extend credit to member banks. 12) In a typical inflationary situation it is not the goal to the Federal Reserve System to replace inflation with depression through the sudden and harsh application of vigorous anti-inflationary controls. Instead its objective is to slow the rate of inflationary expansion to a more sensible and healthy rate of growth matching, if possible, the desired optimum growth without inflation.

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[6]) Board of Governors of the Federal Reserve System, *The Federal Reserve System: Its Purposes and Functions* (Washington: Board of Governors, 1954), p. 151.

[7]) *Ibid.*, p. 134. Also see: W. L. Smith, "Consumer Installment Credit", *American Economic Review*, Vol. 47 December 1957. Especially p. 983.

[8]) By stating that the immediate, direct effects of credit restrictions are uncertain is meant that there is not general agreement as to what these effects are, and to what extent they are restrictive. See, for example, such diverse sources as: S. Weintraub, *Income and Employment Analysis* (New York: Pitman Publishing Corp., 1951), pp. 79—80; R. F. Harrod, *Towards a Dynamic Economics* (London: Macmillan & Co., Ltd. 1948), pp. 48—50; and K. E. Boulding, *Economic Analysis*, 3rd. Ed. (New York: Harper & Bros., 1955), p. 694.

[9]) See: Board of Governors, 1954, *op. cit.*, p. 122.

[10]) *Ibid.*, pp. 122—123.

[11]) Smith, *op. cit.*, 1956 pp. 598—599.

In an inflationary economy, therefore, it may be assumed that the effects of traditional anti-inflationary policies are ordinarily transmitted to the components of aggregate demand-particularly investment, via the tightening of the money supply. It is the objective of these changes in policy, however, to slow the rate of investment, rather than to make investment fall absolutely. If this objective is accomplished, income will rise at a more gradual rate, and consumption also will increase more slowly. Thus, it is ex ante investment, in particular, that is affected directly by traditional anti-inflationary monetary policy. Investment projects already in process will for the most part continue. Additional ex ante investments, where the plans are so formalized that these projects cannot be delayed, also will go ahead. Those investments where the marginal efficiency of capital is above the fringe disturbed by the monetary action also will probably be realized. In all likelihood those ex ante investments that do not materialize will lie in the fringe, and will include those upset temporarily by the unsettled condition of the money markets, which in some cases will prevent the issuance of new securities.

The rapidity with which traditional anti-inflationary monetary policies affect the economy is of importance to the later discussion. Professor Friedman has observed that at least three lags may be distinghuished between the time that controls are needed and the time that they are effective. 13) First, there is the recognition lag, which encompasses the time that elapses between the need for action and the recognition of this need. The duration of this period varies, and is dependent largely upon the reliability of the forecasts made by the mone-

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12) Board of Governors, *op. cit.*, p. 43.

13) Friedman, *op. cit.*, pp. 245—264.

tary authorities. During this time, it is assumed, inflationary pressures continue to exert themselves. Second, the administrative lag, which extends over the interval between recognition and action. The length of this period also varies. It may, for example, take longer to plan for and initiate changes in reserve requirements than to decide on and carry out open-market operations. Inflationary pressures likewise continue to build-up during this period. Finally, there is the operational lag, which includes that interval between the action and the impact of the action on economic conditions. Inflation may continue during this period also, although not necessarily at an unabated rate. Added to the time of these lags may be additional delays because an increase in the velocity of money tends to offset the reduction in supply, or/and there is a more efficient utilization of the money supply. [14]) There also may be delays, depending upon the length of the multiplier time period, before the full effects of a reduction in investment (or in the rate of growth of investment) permeate the economy. [15]) Monetary policy, therefore, may not operate very rapidly in curtailing aggregate demand and in containing inflation, although it appears to be generally agreed that its deflationary effects will eventually become evident. As Professor Smith has noted: „...monetary policy's first impact is on the asset structure, and only through its effects on this structure does it indirectly and with some delay affect the income stream." [16])

Here then, has been presented briefly the modern treatment of traditional anti-inflationary monetary policy. These policies affect lenders and the money supply and, with some delay, tend to curb the (rate of) expansion of investment, and subsequently of income and consumption.

II

The developments in economic theory that are to be used to establish the conditions under which traditional anti-inflationary policies may be inflationary are three in number. First is the concept of induced investment. J. M. Clark introduced the idea of induced investment in his famous article on the acceleration principle in 1917, but the theoretical concept of induced investment was not considered to be too significant until the relation and the multiplier were combined in the late 1930's, and until it was refined still further by postwar progress in growth and cycle theory. [17]) Second is the so-called "Duesenberry-Effect", which stems primarily from investigations into the problems of the Keynesian consumption function. [18]) Finally, the theory of administered prices and kinked demand curves is significant. [19]) These developments will be examined in turn in the following paragraphs of this section.

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[14]) Smith, *op. cit.*, 1956.

[15]) For a recent appraisal of that difficult subject, "the multiplier time period", see: Gardner Ackley "The Multiplier Time Period: Money, Inventories, and Flexibility", *American Economic Review*, June, 1951, XLI, pp. 351—368.

[16]) Smith, *op. cit.*, 1956, p. 606.

Before going into this analysis, however, it should be stressed, once again, that the investment with which this discussion is concerned consists of ex ante (or planned, expected, or anticipated) investment, rather than ex post (already realized) investment. Changes in monetary policy affect the volume of ex ante investment: they do not affect the volume of investment that has already taken place.

For certain theoretical purposes it has become conventional in recent years to divide total ex ante investment into the categories of induced and autonomous. The theoretical test which relegates any particular ex ante investment expenditure into either of these classes is its reaction to the prevailing state of economic activity. Autonomous investment is independent of the level of, and changes in, income and consumption. It depends upon such factors as innovations, changes in public policy, and population growth. Autonomous investment may change with changes in income, although it is not dependent upon such changes; or it may vary even though income remains constant. Ex ante induced investment, on the other hand, is directly related to the level of, and changes in, income and consumption. [20]) Part of induced investment has been attributed to the mechanism of the acceleration principle, and results from the *rate of change* in income. If income increases at a decreasing rate, induced investment will fall. If income increases at a constant rate, induced investment will be maintained. If income increases at an increasing rate, induced investment will expand. The remainder of induced investment is related to the level of income, and to changes in income, rather than to changes in the rate of change. It is reasonable to assume that, at least up to some extremely high point, ex ante induced investment will grow as income increases, so that it will be larger when income is high than when income is at low levels. There are two reasons for this assumption: (1) Since consumption increases as income grows, these additional consumption purchases should induce more and more investment, and; (2) Because of uncertainty the marginal efficiency of capital is to a large extent dependent upon current and recent levels of, and changes in, income and sales, rather than upon the future behavior of these variables.

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[17]) J. M. Clark, "Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles", *The Journal of Political Economy*, Vol. XXV, No. 3, March, 1917; P. Samuelson, "Interaction between the Multiplier Analysis and the Principle of Acceleration", *The Review of Economic Statistics*, May, 1939. The postwar work on induced investment has been so voluminous that it would be unjust to cite any one author. A recent book on this and related topics, with footnotes covering much of the work by others in this area, is: D. Hamberg, *Economic Growth and Instability* (New York: W. W. Norton & Co., Inc., 1956).

[18]) J. S. Duesenberry, *Income, Saving, and the Theory of Consumer Behavior* (Cambridge: Harvard University Press, 1949).

[19]) One of the first articles on "kinked" demand curves was written by: Paul M. Sweezy, "Demand under Conditions of Oiligopoly", *The Journal of Political* Economy, Vol. XLVII (1939), pp. 568—573. The concept of administered prices is probably as old as the study of monopoly, but has become of particulier interest in recent years.

It is customary in model building to lag induced investment behind changes in income. This is done, usually, for two reasons. First, unless there is a lag, induced investment takes place within the period in which changes in income occur, resulting in further changes in induced investment, and producing more income, etc. A model in which induced investment is not lagged, therefore, is essentially unstable and unrealistic. [21]) Second, as Professor Hamberg points out in his comments on the lag:

> "For one thing, there is the well-known dictum that the immediate past is the best thing that business firms have to go on. Beyond this, however, there is the ever-present fear of loss of market position to competitors that induces firms to expand, even reluctantly, in response to a general increase in market demand...
>
> Whether induced investment takes place in anticipation of growth or after it is a matter of empirical investigation. What

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[20]) Since consumption is a variable that is generally regarded as highly dependent upon income, the discussion will, for the most part, relate induced investment directly to income alone.

[21]) The length of the lag is of course uncertain and depends in part upon the characteristics of the asset and the length of the gestation period.

> evidence exists appears to indicate that, apart from inventory investment, most induced investment takes place largely in response to already-experienced pressure from demand." [22])

For purposes of this article it is necessary only to note that, during the upswing of the cycle, investment may be classed either as autonomous or induced, and that both categories of investment may increase as income increases. It is more satisfactory (but not essential) to the argument, however, to assume that, as the upswing continues, induced investment becomes much larger than autonomous investment. This assumption is not without a logical foundation. While innovations, if these may be assumed to be the initial cause of the upswing, result first in autonomous investment, it is likely that additional investments in the innovating industries will be classified as induced, since they will most likely take place in response to increases in demand for the new commodities or services. Further, while induced investment may move up slowly in the revival stage of the upswing because of excess capacity in the economy, it is likely that as capacity is utilized more fully the value of the relation will increase, and the marginal propensity to invest will be a larger value. [23]) Finally, as income increases sales will become ever larger, requiring more substantial amounts of induced investment.

These, then, are the main features of induced investment. First, that induced investment is dependent upon rates of change, and changes, in economic activity. Second, that ex ante induced investment is dependent principally upon the behavior of income in the past. Third, that during an inflationary expansion it is likely that induced investment is a larger part of total investment.

The Duesenberry effect can be set forth briefly. According to this principle, consumption in the present is dependent to a great extent upon the highest level of income in the recent past. This concept is based upon the widely recognized idea that persons lower their standards of living with the greatest reluctance. According to this principle, therefore, if income should decline consumption would decline also, but consumers would be influenced by the high levels of income in the recent past, so that their expenditures would perhaps lag behind downward changes in income, and move more slowly down than they had moved up as income was increasing.

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[22]) Hamberg, *op. cit.*, pp. 304—305.

[23]) Many theoretical model-builders believe that the ex ante investment function is curved, along the lines outlined here. See, for example: N. Kaldor, "A Model of the Trade Cycle", *Economic Journal*, March, 1940; and, R. M. Goodwin, "The Nonlinear Accelerator and the Persistence of Business Cycles", *Econometrica*, January, 1951.

There is only one aspect of the theory of administered prices and the kinked demand curve that is of interest to this article. This is that there is a tendency in the modern economy for business firms to resist price declines, and to welcome price increases. In other words, the demand curve, as viewed by many businessmen, is a reflex rather than an obtuse curve. 24) The experience of the recent recession, during which prices were maintained at relatively high levels, seems to be indicative of the widespread distaste that businessmen have for price reductions. Also the upward movement of prices in the postwar years, and the readiness with which many large firms have appeared to raise prices for any reason, seems to lend substance to the idea that price increases are relativity easy to effect.

Each of these developments in economic theory is related to the use of traditional anti-inflationary monetary measures in the following section, to show how these measures may actually bring about further inflation.

III

Before proceeding to illustrate how anti-inflationary monetary policy may be inflationary, it is necessary to refine further the concept of induced investment, which is the most important variable in this argument. Ex ante induced investment bears principally a lagged but dependent relationship to relatively recent changes in income. 25) If this relationship does describe reality, then depending upon the size of the relation and the appropriate extent of the change in income in the past, a certain desired volume of induced investment should be forthcoming in the present. This volume of ex ante investment, which is, so to speak, required by past events, is essential to fulfill businessmen's expectations of the required volume of goods

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24) See, in particular: C. W. Efroymson, "A Note on Kinked Demand Curves", *American Economic Review*, March, 1943, pp. 98—109.

25) Although induced investment seems to be dependent upon rates of change, and levels, of income, it seems to be described most frequently in the literature as dependent primarily upon past changes in income. For example, the formula, $I_t = \beta\,(Y_{t-1} - Y_{t-2})$, where β is the relation, t is the number of the period and Y equals income, is often used. See: Hyman P. Minsky, "Monetary Systems and Accelerator Models", *American Economic Review*, Vol. XLVII, No. 6, Dec., 1957, p. 860; and Kurihara, Kenneth K., *Introduction to Keynesian Dynamics* (London: George Allen and Unwin Ltd., 1956), p. 48, as illustrations of this point.

and services to be produced. If income has recently been growing rapidly in response to the pressure of demand, it is reasonable to assume that businessmen will expect demand to continue, and thus will require a certain volume of induced investment to meet this demand. Expected demand, of course, like expected induced investment, is a variable largely dependent upon past changes in income.[26] If some event or action occurs which reduces the volume of ex ante investment below the required levels, the necessary volume of goods and services will not be produced, and supply will be expected to be less than expected demand. The volume of expected induced investment that should be forthcoming to supply the expected demand may be termed *required* investment, while that volume of ex ante investment which does result because of certain events or actions will be called *actual* investment.

It is now possible to present the major points in the argument that traditional credit restrictions may prove to have inflationary results. It will be assumed that any anti-inflationary monetary measures undertaken by the Federal Reserve authorities are imposed during a cyclical upswing, but prior to that time when the expansion reaches the upper-truning point which would have occurred if these actions had not been taken.[27] At such a time, with inflationary tendencies evident in the economy, but with the turning point not yet in sight, the behavior of the pertinent variables is as follows:

(1) Income and aggregate demand have been increasing during the course of the expansion (perhaps at an increasing rate), and are now at higher levels than previously existed during the upswing.

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[26] This is especially accurate if, as is so often assumed, Consumption also is lagged behind income, so that $C_t = \alpha (Y_{t-1} - Y_{t-2})$, where α equals the marginal propensity to consume. Thus, of the components of aggregate demand, both C and I depend upon past changes in income, and only Government is largely independent. But even Government spending is usually dependent upon past budget decisions, and generally is not immediately alterable.

[27] Obviously, whether monetary policy is anticipatory or remedial, i.e., whether it is timed properly to ward off further inflation, or delayed to reduce present inflation, or both; it probably should be carried out when the relation is relatively large. If anti-inflationary actions are taken when the marginal propensity to invest is falling, or increasing slowly (as in the extreme stages of the expansion) these measures will hasten the down-swing by increasing costs, reducing profit expectations, etc. Thus, the argument assumes that anti-inflationary monetary actions are taken when they are most needed — when the relation is large, and when there is danger of further inflation.

(2) Ex ante induced investment, derived largely from recent changes in income, is growing at a rapid pace, and the relation is large relative to its value earlier in the revival.

(3) Prices, reflecting the pressure of inflationary forces in the economy, are moving upwards.

To this set of assumptions, which does not appear to be unreasonable as descriptions of the behavior of certain variables during a cyclical expansion, add now the imposition of traditional credit restrictions by the Federal Reserve System. The consequences of this action are set forth as follows:

(4) The rate of expansion — and perhaps even the absolute growth itself — of the money supply will be impeded.

(5) The slowing-up of the rate of growth of, or the decline in, the money supply will be reflected, after some delay and perhaps some internal adjustments, in higher interest rates and a restriction of the volume of funds which otherwise would have been available to borrowers.

(6) Sooner or later (depending upon the length of the lags inherent in the system) the effects of this adverse monetary action will filter through to non-financial institutions, where they will become evident first in their impact upon ex ante investment.

(7) The changes in investment will affect income and consumption, so that these variables will perhaps expand at a slower rate, or perhaps decline absolutely.

Points four through seven sum-up, however roughly, the accepted position on the anti-inflationary effects of monetary policy.

It would appear, however, that these conclusions are not always appropriate or, at the least, that another set of conclusions can be reached by slightly altering the premises in the light of the developments in economic theory presented previously, and especially in view of the discussion of induced investment. Furthermore, it might appear that the alternative conclusions attained may be more accurate than those traditionally accepted, since they seem to rest upon a more realistic set of premises. Points one through five above are acceptable, but six and seven must be replaced with alternates, as follows:

(6a) At the time the effects of the monetary action permeate the economy, induced investment is expected to grow at a given *required* rate to meet the needs of expected demand.

(7a) Because of the new credit restrictions, *actual* ex ante induced investment will be below *required* levels. Consumption expenditures, ex ante, will not be immediately affected significantly by the monetary measures.

If these substitute conditions prevail it then appears reasonable that the following conclusion can be reached:

(8) If actual ex ante induced investment is less than required induced investment, businessmen will feel that they are unable to expand output as required; thus the supply of goods and services expected to be forthcoming will be less than the required expected aggregate demand; therefore it will be likely that businessmen will tend to raise prices.

This conclusion appears even more likely when it is considered in the light of the theory of administered prices and kinked demand, for there is reason to believe that businessmen are generally eager to raise prices in the modern economy, and quite reluctant to lower them.

It has been claimed traditionally that restrictive credit policies cause the ex ante investment schedule to fall, resulting eventually in a lower equilibrium level of income. As set forth here, however, it is argued that the *required* ex ante investment curve is a function of the expected demand for goods and services, which in turn depends largely upon the recent behavior of income. In order for the required ex ante investment schedule to shift downwards (over time, of course) expectations of a decline in aggregate demand, and particularly in consumption, would have to prevail. Monetary policy does not necessarily bring about this revision of expectations. Businessmen may still expect that they will have to produce a certain volume of goods and services, and that they will require a certain volume of new capital assets to fulfill their expected production committments. Credit restrictions do not immediately lower these production goals, nor do they reduce the amount of induced investment expected to be required. Traditional credit restrictions do, however, make it unprofitable or impracticable to build up ex ante investment to the required levels. Thus, to employ once again the terminology used previously, credit restrictions tend to hold *actual* induced investment below *required* induced investment, and therefore cause expectations of aggregate supply to fall below expectations of aggregate demand.

The increases in prices that result from the imposition of anti-inflationary monetary policies may or may not be sufficient to offset the decreases in real output that may occur ex post. Under normal theoretical conditions it is probable that the increase in prices will offset equally the ex post fall in output, so that income ex post will be higher than it was in the preceding period, reflecting expected growth. It is possible, though, that the increase in prices may be less than the decline in output, because of imperfect knowledge, in which case income would fall although prices of some commodities might rise. If income did fall, however, it is likely that the short-run tendency of consumption standards to resist change (the "Duesenberry effect"), and the successful price increases on the part of some firms in the economy, might cause businessmen to revise their expectations upwards, so that the decline in income would be only temporary. It is also possible that the initial price increases in a part of the economy, in the face of anti-inflationary policies, might lead to an upward revision of the marginal efficiency of capital schedule, whigh might or might not offset the new rate of interest, and cause investment and income to continue their upward movements.

IV

If the arguments that anti-inflationary policies may be inflationary are acceptable, they have serious implications for monetary policy in the future. It is obvious that any tightening of the money supply by traditional methods may lead to a reduction in actual ex ante investment below required ex ante investment, bringing about a disparity between expected aggregate supply and expected aggregate demand, with a rise in prices. Monetary policy, therefore, in order to be most effective in inflationary situations, must attempt to affect principally expected aggregate demand, composed of ex ante consumption and ex ante required investment — to lower it below the inflationary rate of growth. The most satisfactory way in which this can be accomplished at present is through direct controls, such as Regulation W, and perhaps through additional similar devices, which tend to restrict the growth of aggregate demand to desirable and less inflationary rates.

CHOC INFLATIONNISTE DU AUX POLITIQUES MONETAIRES ANTI-INFLATIONNISTES TRADITIONNELLES

par JOSEPH W. McGUIRE

RÉSUMÉ

Les politiques monétaires traditionnelles de nature anti-inflationniste sont: 1) une augmentation des taux d'escompte (et d'intérêt); 2) la vente de bons d'obligations sur le marché, opérations d'open-market; 3) et un revirement vers l'accroissement des besoins en réserves. En général, on peut admettre, semble-t-il, que n'importe laquelle de ces mesures (ou n'importe quelle combinaison de ces mesures) a pour résultat soit une réduction du volume absolu de l'investissement, soit au moins un fléchissement du taux d'accroissement de l'investissement — ceci dépend de la vigueur de l'action entreprise. D'habitude on n'estime pas qu'une politique monétaire anti-inflationniste perturbera dès le début d'une façon appréciable les autres composantes de la demande totale, à savoir les dépenses des consommateurs et les achats de biens et services faits par l'Etat: quoique les premières diminuent au fur et à mesure que les revenus sont affectés par le déclin (du taux de croissance) des investissements. Ce paragraphe résume brièvement la position actuellement acceptable de la plupart des économistes et des banquiers sur les effets anti-inflationnistes d'une politique de restriction monétaire.

La critique faite dans cet article de l'attitude traditionnelle repose en gronde partie sur l'idée d'investissement *induit*. Ces dernières décades, c'est devenu, à certaines fins théoriques, une pratique courante parmi les économistes de diviser l'investissement total en deux catégories: investissement *induit*, et investissement *autonome*. L'investissement induit est celui qui dépend (en grande partie) de changements récents dans les revenus, tandisque l'investissement autonome est indépendant de tels changements. Si pour des raisons

de simplicité, on suppose que l'économie est en état de plein emploi, l'investissement induit se compose des augmentations de capitaux fixes, par exemple, faites afin de produire le volume additionnel de biens qui, comme s'y attendent les hommes d'affaires, sera sans doute demandé. En période d'inflation, il semble raisonnable de supposer qu'il y aura plein emploi ou presque, donc il sera nécessaire d'augmenter l'implantation industrielle et l'équipement, si on attend un accroissement de la demande, et si l'offre doit suivre la demande attendue. De plus, l'investissement induit est, par hypothèse, décalé dans le temps, c'est à dire qu'il dépend des changements *antérieurs* survenus dans les revenus. Ceci semble également raisonnable, car il est douteux qu'on puisse construire des biens fixes immédiatement pour répondre à une augmentation de la demande, surtout dans une économie de plein emploi ou presque. Ainsi, au moment adéquat pour imposer une action monétaire anti-inflationniste, il faudrait qu'un certain volume d'investissements induits soit prêt à entrer en action, afin de produire le volume de biens *nécessaire* pour faire face à la demande anticipée.

Néanmoins, si les autorités bancaires centrales appliquent à ce moment des restrictions de crédit, ces restrictions auront tendance à maintenir l'investissement induit *effectif* au-dessous du niveau de l'investissement. induit *nécessaire*. Les hommes d'affaires vont prévoir que le montant à venir de la production de biens finaux sera moindre que celui de la demande attendue de ces mêmes biens. En conséquence, les prix tendront à monter, au moins à court terme. Etant donné que les hausses de prix sont la marque même de l'inflation, des politiques monétaires anti-inflationnistes ont pour résultat effectif des réactions inflationnistes de l'économie.

EXCISE TAXATION AND QUALITY OF PRODUCT

by JOSEPH GUERIN

Saint Joseph's College Philadelphia, Pennsylvania

According to the modern theory of the firm the quality of a firm's product is a factor which, like price or output, may be varied by the firm in its attempt to maximize profits. As a consequence a change in the quality of the product is a possible effect of excise taxation. While one finds mention of this possibility scattered among the writings of those who have analyzed commodity taxation, nowhere is this effect studied with the same care with which the price and output effects of excises have been analyzed. [1]) This slight has no doubt been due in part to the belief that quality is not a quantifiable variable. But some changes in quality, particularly those which are likely responses to commodity taxation, are associated with changes in the average costs of production. Thus production costs, or, more precisely, those costs related to the variable quality of the product, supply us with an index of quality by which we might examine the factors determining the degree of quality change that results from a tax.

Quality change is likely, if not imperative, in markets in which a change in the price of the taxed commodity is not feasible, for example, (1) where price is low and where the optimum-profit price increase would be a fraction of the smallest currency unit, or (2) where a commodity has a customary price. Even where price is variable a combined change in both price and quality may lead to a more profitable adjustment to a tax than a change in price alone. In the following the effect of an excise tax upon quality will be considered first for the case in which price is constant and then for the case in which it is variable.

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[1]) See, for example, J. B. Say, *A Treatise on Political Economy*, C. R. Princip, trans., (Philadelphia: Grigg and Elliot, 1936), p. 465, and U. K. Hicks, *Public Finance*, (London: Nisbet and Co., 1948), p. 157. The topic is briefly treated by J. F. Due, „Monopolistic Competition and the Incidence of Special Sales Taxes", in *Readings in the Economics of Taxation*, R. A. Musgrave and C. S. Shoup, eds., (Homewood, Illinois: Irwin, 1959), pp. 357-58.

PRICE CONSTANT

In Fig. 1 money totals of revenue, costs, and profits are measured along the vertical axis and quantity of the product along the horizontal.[2] Line OA indicates the total revenue associated with each

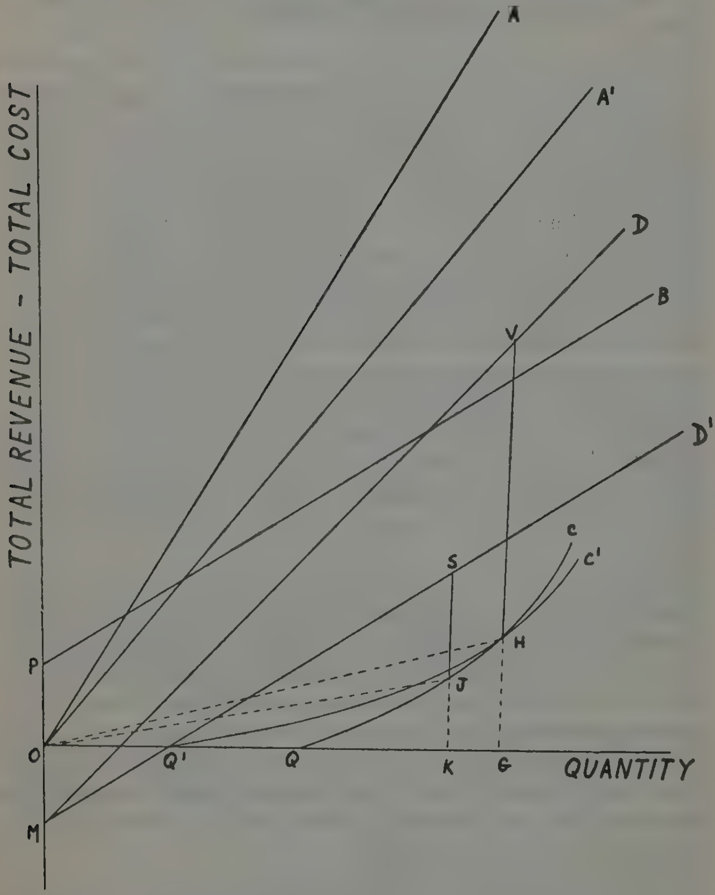

Fig. 1

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[2] Fig. 1 has been suggested by that used by Hans Brems, *Product Equilibrium under Monopolistic Competition,* (Cambridge: Harvard University Press, 1951), p. 60.

level of output. To facilitate the comparison of the quality of product at different points of equilibrium costs are divided into those related to the production of the basic commodity and those related to the variation in the quality of the product — the expenditure for the additional or more expensive inputs which make the product more attractive. Total cost of the basic commodity for the different levels of output are shown as PB which, for convenience, is drawn to shown constant marginal costs. The total cost of the quality element of costs at the different levels of ouput is represented by line QC. For quantity demanded to be a given amount at the fixed price the product must be of a certain quality, achieved with a certain cost of improving the quality of the basic commodity. Thus line QC, relating the total cost of the quality element with level of output, represents the relationship between quality of product and quantity demanded. (As drawn, QC implies that when no expenditure is made to improve the quality of the basic commodity the quantity demanded will be OQ.) On the presumption that the extra cost of improving the quality of the product sufficiently to induce an additional sale rises as the quantity to be sold increases, QC is convex to the horizontal axis.

The average cost of the quality element of costs, which will serve as an index of the quality of the product, is measured graphically by the size of the angle formed by the horizontal axis and a gradient drawn from the origin to the point on QC corresponding to the relevant level of output. Thus for output OG average quality-cost is the total of quality-cost over output, or $\frac{HG}{OG}$, which is the tangent to angle HOG.

If the total cost of the basic commodity is subtracted from the total revenue curve, giving MD, the net revenue for each of the quality-quantity combinations may be found by subtracting QC from MD. Profits are at a maximum at that output at which the slope of MD is equal to the slope of QC, or output OG, where profits are HV and the quality of the product is that associated with an average quality-cost measured by angle HOG.

When an excise tax is imposed the amount of tax paid at each level of output is subtracted from line OA to give OA′, and PB, the cost of the basic commodity, is subtracted from OA′ to give MD′. The maximum-profit output, yielding profits of SJ, is now OK and corresponds to a quality of product whose average quality-cost is measured by angle JOK. The tax reduces output, diminishes profits, and lowers the quality of the product.

The extent of the decrease in quality depends in part upon the shape of the cost function for the basic commodity. With increasing marginal costs for the basic commodity, line PB would appear as convex to the horizontal axis and MD would thus be concave to the horizontal axis. If such an MD was drawn so that its slope at output OG was equal to the slope of GC, the pre-tax output and quality would be the same as for the figure drawn. But the post-tax equilibrium would be attained at a higher level of output and hence a higher quality of product than originally. (The curvature of the new MD′ being greater than that of the original MD′, the point at which its slope and the slope of QC are equal would be reached with a smaller reduction in output.) Thus both the price increase of traditional theory and the quality change of this analysis vary inversely with the slope of the marginal cost curve for the basic commodity.

The other determinant of the amount of product deterioration caused by the excise is the degree of responsiveness of consumers to a change in quality. If consumers were more quality-conscious, a given change in the average quality-cost would be associated with a greater change in quantity demanded. Line Q′C′ possesses this characteristic. (This may be seen by inserting an angle smaller or larger than angle HOG and noting that the change in quantity demanded, as found from Q′C′, is greater than the corresponding change for QC.) Q′C′ is drawn so as to have the same slope and height as QC at output OG, and thus to show the same pre-tax equilibrium quantity and quality. In adjusting to the tax, output and quality must be reduced to a point where the slope of the quality-cost curve equals the slope of MD′. But since the slope of Q′C′ falls more rapidly than that of QC, equilibrium will be reached with a higher level of output and a higher quality of product. Just as the relatively great response of quantity demanded to a change in price tends to lessen the price increase due to a tax, so also does a greater sensitivity to quality change reduce the degree of quality deterioration.

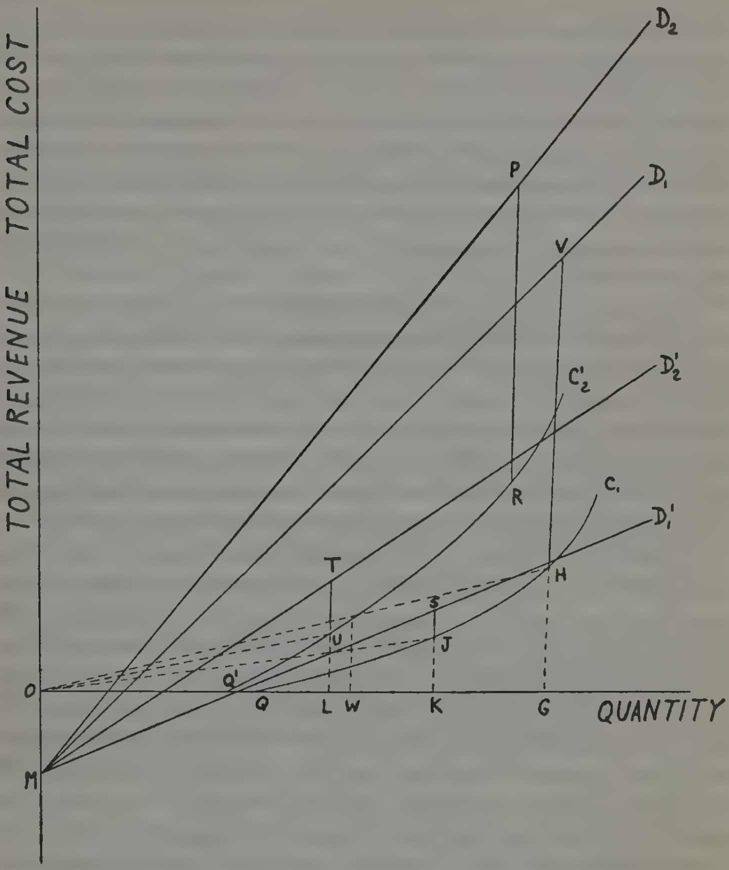

Fig. 2

PRICE VARIABLE

To determine the most profitable quality of product where price is variable the preceding process is repeated for each possible price to discover the quality-output-price combination yielding the greatest profit. Fig. 2 shows the relevant curves for two possible prices. MD_1

and QC_1 are taken from Fig. 1 and show, respectively, the revenue net of production costs of the basic commodity and the relationship between the costs of quality improvement and quantity demanded, both for the lower price. MD_2 and $Q'C_2$ are the corresponding curves for the higher price. $Q'C_2$ lies above QC_1 at each level of output to indicate that a higher average quality-cost is necessary to maintain any level of quantity sold where sales occur at a higher price. The figure is drawn to show profits at the equilibrium position for the lower price (HV) greater than those of the higher price (RP). The equilibrium quality is that related to an average quality-cost measured by angle HOG.

An excise tax lowers the revenue net of basic production costs at each level of output by the total amount of tax paid at that output, giving MD_1' and MD_2'. (As drawn, the excise tax is a specific tax. An ad valorem tax would lower the slope of MD_2' still farther.) Now the optimum adjustment under the lower price yields a lower profit (SJ) than the profit from the best adjustment under the higher price (TU). The tax has raised price, lowered profits, and reduced the quality of the product to that level indicated by angle UOL.

As before, the slope of the marginal cost curve for the basic commodity and the responsiveness of consumers to a change in the quality of the product influence the degree to which quality will change. In addition, the responsiveness of quantity demanded to a change in price, the slope of the usual demand curve, exerts an influence, since now both price change and quality change are available modes of adjustment. The price-quantity demanded relationship for any given quality of product may be derived by extending the gradient for a given average quality-cost angle and noting the quantity at which the gradient intersects the quantity-total quality-cost curve for each price. Thus with a quality of product represented by angle HOG in Fig. 2, the quantity demanded at the lower price is OG while the quantity demanded at the higher price is OW; the price rise is accompanied by a reduction in quantity demanded of GW.

Now if the price associated with the quality-cost curve $Q'C_2$ had not been as high as that assumed, the smaller price rise would have been associated with the reduction GW in quantity demanded; that is to say, quantity demanded would have been more responsive to a change in price and thus the slope of the usual demand curve smaller. But a lower price would mean that MD_2' would pivot clockwise on M, with its slope equaling that of $Q'C_2$ at a point on $Q'C_2$ to the left of U at which the average quality-cost would be less than angle UOL. Should this pivoting reduce the profit of the best adjustment with the higher price so that it is less than SJ, the post-tax profit with the lower price, price would not rise at all and the chosen quality would be that having an average quality-cost of JOK. The greater responsiveness of quantity demanded to price change is therefore linked to a smaller rise in price and a greater deterioration in quality.

To represent a lesser degree of sentitivity to price change we would pivot MD_2' counter-clockwise on M. (That is, the price change associated with a given change in quantity demanded with a product of a given quality would be greater.) The point on $Q'C_2$ where its slope is equal to the now greater slope of MD'_2 will lie to the right of U: the reduction in quality is less. In fact, it is possible that the best adjustment to the tax involves a product of higher quality than the pre-tax product. Such an outcome is likely where a low responsiveness to price change is combined with a high responsiveness to quality change, particularly where firmly established price lines prevent small changes in price but admit larger ones.

It is evident from Fig. 2 that quality deterioration does not leave the seller free of any burden of the tax. While the seller might be able to make a better adjustment to the tax where he may vary quality than where he may not, he will still find profits lower than they were before the tax.

OLIGOPOLY

The cost of the quality element necessary to induce a certain level of sales at a given price depends in part upon the price charged and the quality of product offered by other sellers. The curves relating quantity demanded to the cost of the quality element remain fixed only if the prices and qualities of the products of other sellers do not change, and these curves must remain fixed if they are to indicate the optimal price-quality-quantity adjustment to an excise tax. Thus the implicit assumption of the preceding analysis is that the price-quality decisions of other firms will not be affected by the similar decisions made by the firm under consideration. This assumption is reasonable where there is but one seller or where there are very many sellers, but where there are few sellers decisions become interdependent. In place of one set of curves relating quality-factor expenditure and quantity demanded at each price, there will be one set for each possible reaction of other sellers. The resulting uncertainty concerning the response of other sellers leaves the post-tax equilibrium indeterminate.

It is widely accepted, however, that in markets in which firms have a feeling of interdependence that an excise tax will lead initially to a price rise equal to the amount of the tax. An excise tax simultaneously and publicly raises the marginal cost curve of all firms. The uncertainty of the price response of other firms which usually accompanies a price change under oligopoly largely disappears when each firm, in changing its price, knows that all other sellers of the taxed commodity are adjusting to the same tax. The fact that price initially rises by the amount of the tax does not, however, rule out a concommitant variation in quality. The analysis of product equilibrium in this case becomes similar to the case in which price is fixed; although prices different from the original price plus tax are possible they are not in fact chosen. The quality of product that was optimal at the pre-tax price is not necessarily optimal at the new price, and the curve relating quality-cost to sales at the new price (based on the assumption that other firms have raised their price similarly) will be used to indicate the optimum quality of product. If, however, there remains considerable uncertainty concerning the quality response of other firms to the quality change initiated by one seller, and, more important, the effect of this upon its own sales, the outcome remains indeterminate.

CONCLUSION

If it is accepted that the quality of the product is a controllable variable to be manipulated like price and output to maximize the profits of the firm, then there is no basis for assuming that quality does not change when an excise tax is imposed. Nor is our inability to find a cardinal measure of quality from the point of view of the consumer a justification for ignoring quality change. The average cost of the quality element associated with different levels of demand provides us with an ordinal measure of quality from the point of view of the consumer and an index of the direction and extent (in a „greater than" or „less than" sense) of quality change under various circumstances relating to tastes and production.

DROITS D'ACCISE ET QUALITE DES PRODUITS

par JOSEPH GUÉRIN

RÉSUMÉ

On peut déterminer l'effet d'un droit d'accise sur la qualité de la marchandise imposée en distinguant dans la totalité des coûts ceux qui se rapportent à la production du produit de base et ceux qui se rapportent à l'amélioration de la qualité du produit de base. Cette distinction permet le calcul du coût de l'unité de l'élément-qualité qui sert d'indice de qualité. Au moyen de cet indice, on peut comparer la qualité du produit avant et après l'imposition et analyser les facteurs qui déterminent l'importance du changement de qualité.

Si le prix du produit est constant, l'imposition de la marchandise incitera une entreprise basée sur le profit maximum à abaisser la qualité de sa production. L'importance de l'abaissement de la qualité dépendra de la réaction des consommateurs à la modification de la qualité et des conditions de coût de production du produit de base, une grande sensibilité des consommateurs et des coûts marginaux à élévation rapide tendant à limiter le changement dans la qualité. Quand le prix est variable, un autre facteur déterminant est la réaction de la demande à un changement de prix, la pente de la courbe de la demande habituelle. Une courbe en pente rapide pour un produit de qualité donnée accompagne un changement relativement faible de qualité. En certains cas, il est possible que l'amélioration de la qualité et un prix plus élevé constituent la compensation la plus rénumératrice.

Dans les marchés oligopolistiques, le changement de qualité pour une entreprise pourra être déterminé s'il existe une convention générale des oligopoleurs que les prix augmenteront du montant de la taxe et si chaque entreprise ne tient pas compte de la possibilité d'une diminution des ventes par suite de la réaction des autres entreprises opérant aussi un changement de qualité.

LA FORMATION DE CAPITAUX PAR DES MESURES FISCALES DANS L'EMPIRE PORTUGAIS

par Dr. RALPH von GERSDORFF

Research Associate at the Harvard University Center for International Affairs

La première question qui se pose pour un économiste étudiant l'économie portugaise est la suivante: peut-on vraiement parler de pénurie de capitaux dans l'Empire Portugais *)? La réponse doit être oui, car il s'agit bien d'une pénurie „sui generis". Les banques montrent une liquidité extrême, unique en Europe, parce que la législation à ce sujet a été rigoureuse et seulement en 1958 on a admis de la part du Gouvernement un taux de liquidité, qui s'approche plus de ce qui est normal dans ce secteur. On ne peut pas accuser entièrement la législation antérieure pour cet état de choses, car ce sont les dépositeurs eux mêmes qui préfèrent laisser leur argent „à vue" dans les banques. Les dépots qui surpassent un an sont très rares et les taux d'intérêt n'animent pas (les gens qui épargnent) à placer leur argent à longue vue. En effet le Portugal se permet d'avoir un niveau de taux d'intérêts très bas, comme un pays riche! Cette politique de la monnaie à bon marché a certainement eu de grands avantages, mais comme l'esprit d'initiative n'y est pas très grand, on n'a pas profité suffisamment et on aurait peut-être stimulé beaucoup plus l'épargne si on avait suivi une politique de taux d'intérêts plus élevés. Même la Caisse d'épargne de l'Etat, la „Caixa Geral de Depósitos, Crédito e Previdência" paie seulement un taux de 1¼ % pour dépots à long terme quand il s'agit de sommes qui ne surpassent pas loo Contos. Cette Caisse est la plus grande au Portugal. Elle a une succursale dans presque toutes les villes. On estime que la thésaurisation au Portugal doit être grande à cause de ce bas niveau des taux d'intérêts, non seulement de la part des gens riches (entrepreneurs, propriétaires de grandes terres etc.) qui thésaurisent leurs profits ou font des dépenses pour se permettre du luxe, des voyages à l'étranger etc. mais aussi de la part de gens qui peuvent faire des petites économies, une classe qui est bien petite au Portugal où n'existe pas encore une grande classe moyenne. Ceux qui ne veulent pas thésauriser pour obtenir un rendement raisonnable pour leurs capitaux et qui ne veulent pas se déclarer satisfait avec les taux négligeables des banques qui ne compensent même pas la dévalorisation continuelle et inévitable de l'argent, investissent leurs capitaux dans le secteur des constructions, investissements peu productifs pour l'ensemble de l'économie. Pour lutter contre cet état de choses il est bien nécessaire de stimuler l'épargne privée de toutes les classes et c'était justement l'objet de mon livre susmentionné, de montrer quelles sont les mesures qu'on peut prendre pour stimuler l'épargne. Je me suis efforcé de trouver aussi des nouvelles méthodes de financement et d'épargne, qui sont applicables dans la situation et dans les circonstances spéciales du Portugal, en considérant aussi la mentalité dominante relativement à l'épargne et aux financements. Pour le moment il reste malheureusement un seul moyen pour augmenter la formation de capitaux au Portugal et dans les Provinces d'outre-mer: rendre le système fiscal plus efficace pour compenser le manque subit dans le domaine de la formation de capitaux privés. Cette mesure ne doit pas empêcher les efforts dans ce domaine. Un exemple bien instructif est celui du Congo Belge, où l'on a même réussi à introduire l'épargne chez les noirs. Comme le Directeur Général de la Caisse d'Epargne du Congo Belge, M. Henri Désirotte, m'avait dit à Léopoldville, la Caisse a souffert des pertes pendant les premières trois années jusqu'à ce que les noirs aient eu confiance et pendant les trois années suivantes la Caisse a obtenue des dépots montant à 20 millions de Francs Suisses venant des noirs ainsi que la même somme venant des blancs. C'est un succès qui montre bien qu'il faut être tenace dans ce domaine. Je dois ajouter, que le taux d'intérêt de cette Caisse est seulement de 3 %, un taux qui est même tout à fait normal dans un pays industrialisé comme l'Allemagne!

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*) Cf. aussi: R. v. Gersdorff, Mesures pour encourager la formation de capitaux privés dans l'Empire Portugais — Possibilités de faire des épargnes et méthodes de financement dans les régions économiquement peu développées (Texte original en allemand). Zürich 1958, Polygraphischer Verlag. — R. v. Gersdoff, L'essor du Portugal. Les réformes financières du Président Salazar, la dette publique et la situation fiscale [illegible] Texte original en allemand). Frankfurt 1960, Verlag Fritz Knapp.

Avant que nous traitions le système fiscal actuel du Portugal il est nécessaire de dire un mot sur la base de ce système, sur les réformes fiscales du Président Salazar. Les livres sur ce sujet sont bien rares.

Ce sont surtout deux thèses françaises qui donnent des informations et aussi quelques publications portugaises: P. Gilles: Le redressement financier au Portugal, Paris 1938 et André de Leffe: La Rénovation du Portugal par le Président Salazar, Poitiers 1942. Dans les travaux que je n'ai pas encore publiés je me suis efforcé d'entrer plus dans les détails et de donner une description minutieuse de l'histoire économique du Portugal avant le Gouvernement Salazar et surtout de ses réformes, parce qu'elles ont été les bases sur lesquelles on a construit le Portugal actuel et sur lesquelles se dresse encore aujourd'hui le système fiscal de tout l'Empire Portugais. Sans avoir pris connaissance de l'histoire fiscale avant Salazar et de ses réformes il n'est pas possible de comprendre la politique financière du Gouvernement actuel au Portugal. Il et donc indispensable que nous donnions même dans cet article une courte description de ces réformes.

Déjà avant d'avoir accepté le poste de Ministre des Finances (le 28 avril 1928) Salazar critiquait les mesures financières du nouveau Gouvernement militaire du Président Carmona. Ce Gouvernement ne voyait aucune autre solution pour le problème financier du Portugal que de demander à la SDN de donner un crédit. Vue que le Portugal avait déjà fait de mauvaises expériences avec les créanciers étrangers, surtout avant la première guerre mondiale (négociations anglo-allemandes sur les colonies portugaises) Salazar ne voulait pas accepter les conditions, à son avis humiliantes, de la SDN. Il a mis de l'ordre dans les finances portugaises à la manière de la „bonne ménagère", en économisant dans le domaine des dépenses publiques et, comme un bon père de famille, en augmentant les revenues sans faire de novelles dettes. Ainsi, son premier budget n'envisageait non seulement plus de déficit — depuis 1917/18 on avait toujours prévu un déficit — mais même un grand surplus et il commençait l'armortissement de la dette flottante qui exerçait une grande influence inflationniste. En même temps Salazar commençait avec la conversion de la dette amortissable, une dette qui était trop chère pour le fisc. Successivement les taux d'intérêts de la dette publique à long terme fûrent baissés. A cause de l'inflation permanente avant le régime Salazar les créanciers de l'Etat portugais avaient toujours perdu avec leurs obligations et le fisc avait assez profité de cet état de choses. La dette réelle avait diminué considérablement. En conséquence le public avait perdu complètement la confiance dans la politique fiscale de l'Etat et préférait placer argent à l'étranger. Pour regagner la confiance Salazar décrétait entre autres la conversion de la dette de $6^1/_2$ % or 1923, une dette qui se trouvait pour la plus grande partie dans les mains de créanciers anglais. Le produit net de cette dette a été utilisé dans le temps pour couvrir les déficits courants des comptes de l'Etat de la même façon que les produits de la dette flottante entre 1919 et 1926. L'offre de conversion que Salazar faisait aux créanciers était unique jusqu'alors parcequ'il favorisait ceux-ci au lieu de l'Etat. A cette époque l'Etat portugais avait déjà assez d'Escudos et de Livres Sterling dans sa caisse pour pouvoir amortir complètement cette dette, de façon que les obligationnaires étaient privés de tout rendement pour leur capitaux. En effet, ils ne pouvaient obtenir un rendement de 4¾ % avec un autre titre d'une sécurité pareille et c'était justement le taux d'intérêt que Salazar offrait aux propriétaires de la vieille dette de 6½ %. Remarquable était aussi le laps de temps que Salazar laissait aux propriétaires pour se décider d'accepter ou non la conversion proposée: 4 mois! Cette conversion était la première d'un type classique que Salazar décrétait: volontiers, pari, simple, juste et longs délais. 90 % des obligationnaires acceptèrent la conversion. C'était bien une preuve que non seulement la confiance dans la politique financière de l'Etat portugais était reconstituée, mais aussi la confiance dans la monnaie portugaise, car on aurait aussi bien pu investir l'argent repayé, après le refus de la conversion dans quelques titres étrangers, représentant Livres Sterling, autres monnaies ou même or. Comme la plupart des intérêts de la vieille dette de 6½ % étaient payées en Livres Sterling parce que les créanciers vivaient en Angleterre, la caisse de l'Etat portugais épargnait beaucoup de devises après la conversion. Elle était alors aussi bien satisfaisante pour l'Etat que pour les créanciers. Comme les économies dans le domaine des dépenses publiques n'étaient pas suffisantes pour équilibrer le budget il était nécessaire de décréter des augmentations d'impôts qui existaient déjà, comme par exemple l'impôt foncier dans les villes (20 à 23 %) et dans la campagne (15 à 20 %), et d'introduire des taxes nouvelles, comme la taxe sur la consommation du sucre, de l'essence et du pétrole (Taxa de salvação nacional) et la taxe progressive sur les salaires et pensions des employés d'Etat, des fonctionnaires et des militaires (Imposto de savação pública). En outre on décrétait un „impôt supplémentaire" progressif sur l'impôt foncier, l'impôt industriel et l'impôt d'application de capitaux au lieu de décréter un impôt personnel sur tous les revenus d'un contribuable. Ce genre d'impôt progressif qui est le plus juste puisque l'Etat charge une personne selon ses moyens et possibilités financières, selon le principe anglais „pay as you earn" ne correspond pas à la mentalité latine. Cette mentalité exige plus de liberté personnelle. On déteste l'idée que l'Etat a le droit de contrôler les affaires financières de l'individu, et qu'il peut controler la comptabilité pour voir si l'on a vraiment payé les impôts selon ses propres possibilités financières. Ce sont plutôt des raisons psychologiques qui semblent interdire qu'on puisse introduire un impôt sur le revenu personnel classique comme en Allemagne, en Suisse ou en Angleterre avec la déclaration personnelle du contribuable, progression considérable etc. Le Président Salazar est même allé jusqu'à baisser certains impôts et abolir les impôts nouveaux susmentionnés (introduits pour équilibrer le budget et assainir les finances publiques) après les réformes financières. Le journaliste français Gabriel Boissy demanda à Salazar en 1936 [1]): „.... Votre situation financière rétablie, Monsieur le Président, vous avez pu réduire vos impôts. Quels sont-ils?" Salazar répondit à cette question:

„Mon Dieu, ils sont à peu près établis comme en France, mais bien moins lourds et nous n'avons pas l'impôt sur le revenu classique, qui ne correspond pas d'ailleurs à notre éducation civique. Lloyd George s'étonnait un jour que nous ne l'ayons pas. Je lui répondis qu'il n'était pas dans nos moeurs, nos moeurs latines, et qu'un impôt doit d'abord cadrer avec les habitudes morales des contribuables. En tout cas, nous sommes enfin revenus à des finances normales. Voilà aussi un des premiers devoirs. Il n'est pas de finances qui résistent constamment aux plus savantes mais irrégulières combinaisons. Il faut donc revenir aussitôt que possible et par les plus simples moyens à la normale. Voilà pourquoi j'ai toujours préféré l'impôt sur les signes extérieurs. Cela fait on dispose de nombre de moyens inespérés."

Aussi les expériences dans les autres pays latins montrent bien, qu'un impôt sur le revenu classique ne donne pas les résultats espérés. En Italie, par example, on avait introduit un nouvel impôt de ce genre en 1950. Les revenus déclarés volontièrement par les contribuables ont augmenté, selon les déclarations, dans la période 1950 à 1951 de 3 % tandis que le revenu national de l'Italie avait augmenté dans la même période de 15 %! Telle était l'expérience en Italie malgré le fait qu'on a fait une propagande intense pour que les Italiens aient ,,conscience de leurs devoirs vis à vis de l'Etat''. On avait même placé des affiches dans les villes montrant une mère avec son fils qui écrit sa déclaration d'impôts et elle lui conduit la main. On avait mis le texte suivant sur cette affiche: ,,Ne trompe pas la mère de tous les Italiens!'' (c'est à dire l'Etat). Même en Allemagne, où l'impôt sur le revenu existe déjà depuis longtemps, on est allé très loin après la deuxième guerre mondiale. Un système de dénonciations contre les fraudeurs parmi les contribuables a été introduit. En Angleterre la ,,morale fiscale'' est devenue très basse après cette guerre à la suite d'expropriations continuelles et après l'introduction d'un impôt sur le revenu. Cet impôt monte jusqu'à 90 %, progression que l'on a pas encore en Allemagne, où la charge fiscale dans l'ensemble est aussi grande qu'en Angleterre, mais ce sont beaucoup plus les contribuables pauvres qui portent la charge que les contribuables riches, une classe qui est de nouveau assez grande en Allemagne Occidentale. Le contribuable anglais était jusqu'à la guerre un homme qui vraiment donnait à l'Etat ce qui lui était dû, mais là aussi la morale fiscale baissait avec la progression ascendante.

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[1]) Bulletin de renseignements politiques, économiques et littéraires, SNI, Lisbonne, Mai 1936.

Il est bien probable que le peuple portugais épargnerait et investirait beaucoup moins, si le Gouvernement chargerait les revenus personnels encore davantage, pour consommer autant que possible et payer aussi peu que possible au fisc. D'un autre côté: même avec la charge fiscale actuelle, qui est la plus basse de tous les pays d'Europe Occidentale, puisqu'elle ne répresente que 10 à 15 % du revenu national brut, les assurances inclues, depuis les réformes fiscales jusqu'à nos jours — la charge dans les autres pays de l'OECE monte à 30 % et plus — il est peu probable qu'on puisse augmenter, comme ce serait à désirer, les sommes d'épargne au Portugal européen et d'outre-mer. On est déjà depuis 1953 au travail pour élaborer un nouveau système fiscal avec l'introduction d'un impôt de revenu puisque le régime fiscal actuel est déjà en vigeur, avec quelques modifications loin d'être fondamentales, depuis les réformes fiscales de 1928—33. Il est fort douteux que ce plan se réalise parce que les classes qui soutiennent le régime actuel, les militaires, les industriels, les grands propriétaires et le clergé n'ont aucun intérêt de changer le système fiscal actuel, qui est très avantageux pour eux. Ce sont eux aussi qui profitent déjà aujourd'hui du niveau très bas des salaires pour employés et ouvriers, un niveau qui est aussi bas qu'en Espagne, qu'en Grèce etc., des prix bas fixés par le Gouvernement pour beaucoup de produits venant des Provinces d'outre mer (par exemple le coton), le régime corporatif qui n'admet pas des grèves, qui permet de constituer des monopoles et d'obtenir des droits exclusifs pour la production („exclusivos") etc. avec l'aide de l'Etat et d'autres avantages encore comme tarifs de douane protectionnistes, politique économique nationaliste etc. La classe des industriels est donc bien privilégiée par l'Etat portugais actuel comme une classe qui a besoin d'une espèce de „protection de la nature" comme une classe rare qui est menacée de l'extinction! Elle est protégé de tout risque — souvent l'Etat prend le risque d'une nouvelle industrie avec le produit des impôts et aussitôt que cette industrie donne de bons profits il la vend aux capitalistes et industriels pour laisser agir „l'initiative privée". En outre les „charges sociales" sont minimes et les ouvriers et employés d'une entreprise sont obligés de payer autant à la caisse de prévoyance sindicale ou ordinaire que le patron:

	Patron	Employé ou ouvrier
A la caisse de prévoyance	7%	5½% du salaire
A la caisse pour les compensations des charges familiales (abono de familia)	7%	1 % „ „
Au fonds pour l'aide aux chômeurs . .	1%	1 % „ „

Si les industriels et les patrons de toutes les branches d'activité économique sont si bien protégés par l'Etat: pourquoi ne sont ils pas de vrais „entrepreneurs", qui risquent leur capital, qui réinvestissent dans leurs entreprises, économisent pour investir ensuite dans la propre entreprise ou dans une autre entreprise nationale? Pourquoi dépensent-ils tellement pour se permettre du luxe, des voyages à l'étranger, en somme, pourquoi disposent-ils de leurs moyens d'une manière non seulement point avantageuse pour l'économie nationale mais même d'une manière nocive? Tandis qu'autrefois le système patriarchale avait au moins l'effet que le patron était lui même „l'assurance sociale" de son employé, aujourd'hui les efforts dans ce domaine laissent à désirer pour ne pas dire qu'ils sont complètement insuffisants parce que l'on pense que ce sont les caisses de prévoyance qui s'occupent avec cette assurance, sans toutefois se mettre dans la condition de l'ouvrier pour lequel cette assurance ne suffit même pas pour ses besoins les plus urgents. Le petit employé et fonctionnaire d'Etat, les deux touchent aussi un salaire si bas qu'il sont forcés d'accepter un travail accessoir dans leurs heures libres et en outre ils doivent encore payer l'impôt professionel qui est déduit de leur salaire par le patron; c'est un impôt qui ne laisse pas la possibilité de tromper l'Etat, ce qui est possible par exemple avec l'impôt industriel que paient les industriels et commerçants et l'impôt d'exploitation (imposto sobre explorações) dans les Provinces d'outre-mer, impôts qui sont fixés pour chaque contribuable par une commission, où les contribuables ont un représentant et qui estiment le revenu selon la récolté probable. Considérant ces faits, on arrive à la conclusion qu'il ne sera peut-être pas possible d'introduire un impôt sur le revenu, mais il sera au moins nécessaire de décréter un impôt sur les profits comme le „Profits-Tax" anglais et une taxe spéciale sur la vente des marchandises de luxe importées. Si les privés ne fructifient pas l'économie nationale avec leurs capitaux, c'est donc l'Etat qui doit prendre l'initiative, qui doit imposer les privés et investir ces capitaux aussi économiquement et productivement que possible. Ce n'est pas une solution idéale — une vraie initiative privée serait préférable — mais une solution nécessaire. D'autres mesures s'imposent encore desquelles nous parlerons plus tard. En 1935 Salazar disait aux contribuables portugais[2]: „...Beaucoup désormais paieront moins que ce qu'ils payaient, mais ils resteront muets; beaucoup paieront plus, non pas plus que ce qu'ils doivent, j'espère, mais plus que ce qu'ils payaient, et ils donneront libre cours à leur indignation. C'est le propre de la nature humaine, les intérêts satisfaits se taisent et les intérêts blessés se plaignent, et s'il en est ainsi dans le gouvernement des peuples, rien ne sert de nous lamenter. Pourvu au moins que l'on ne crie pas avant l'heure..." Avant le régime Salazar les gens qui faisaient des économies, les propriétaires des titres de l'Etat et ceux qui reçoivent des salaires ont beaucoup soufferts avec les inflations violentes et cruelles du régime parlementaire. On ne peut pas les blâmer tellement s'ils se plaignent sur les impôts. Là aussi les autres classes, les classes débitrices ont profité et aussi eux se sont enrichis pendant la guerre quand Salazar n'était pas capable d'éviter une „inflation importée", une dévaluation de la monnaie portugaise de 50 % environ qui a atteint en 1950 63 %. Grâce aux efforts de Salazar l'inflation typique quasi inévitable dans les pays économiquement peu développés, a pris dans le Portugal la forme d'une inflation lente, „glissante" qui ne surpasse pas

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[2]) Cité par Chr. Melchior-Bonnet dans „Principes d'Action", Librairie Arthème Fayard, Paris 1956, p. 128.

2 à 5 % par an. Mais ce résultat est aussi dû au fait que la politique de développement économique était trop lente, si lente, qu'on n'a pas réussi à augmenter suffisamment le revenu national (suffisamment audessus de la croissance de la population). En 1955 par exemple, aussi à cause d'une mauvaise récolte, la valeur réelle du produit national brut a augmenté seulement de 1,2 %, ce qui représente justement le taux de la croissance annuelle de la population du Portugal européen. La science économique moderne considère que l'augmentation du produit national devrait être deux fois plus grand que la croissance de la population, un résultat qu'on a pu réaliser au Mexique où le produit national a augmenté chaque année de la période 1952—1954 de 6 à 7 % tandis que la croissance de la population s'élevait en même temps chaque année à 3 %, un des taux les plus élevés du monde. On n'a pas réussi au Mexique à dominer l'inflation aussi bien qu'au Portugal, mais même avec cette inflation on a pu augmenter le revenu *réel* du peuple mexicain. Déjà en 1929 le Ministre des Finances Salazar a fait savoir son intention de lutter contre l'inflation [3]:

„.... Si nous divisions en deux grandes classes tous les individus qui composent la population, suivant leur position de créanciers et de débiteurs, — d'un côté, les propriétaires, les porteurs de titres, les capitalistes, les fonctionnaires, les ouvriers (également créanciers par leurs traitements et par leurs salaires), et de l'autre, les commerçants, les industriels, les agriculteurs, qui travaillent en général à crédit et qui sont par conséquent débiteurs, — nous constatons que les dévalorisations successives de la monnaie favorisent un groupe et surchargent l'autre: elles réduisent les dettes de la production, et ainsi la facilitent momentanément, mais en fin de compte, elles finissent par détruire les conditions de son développement et la capacité de consommation de ses marchés. Cette constatation nous imposait de ne pas sacrifier davantage les capitaux, bases et facteurs du futur progrès économique, et, pour les épargner, d'imposer les sacrifices nécessaires à tous les revenus de la Nation. De là un double objectif: *assurer autant que possible une valeur stable à la monnaie et, surtout, ne pas permettre de nouvelles dépréciations: ensuite élever les impositions au niveau exigé par les besoins réels* de l'Etat..."

Malheureusement le régime Salazar n'a pas réussi à élever la capacité de consommation du peuple portugais. Il a sauvé ce peuple de l'abîme, il a évité une catastrophe, mais les classes modestes touchent toujours le même salaire qu'auparavant. Un ouvrier d'usine gagne toujours comme avant la guerre entre 20 et 30 Escudos par jour et un ouvrier agricole encore beaucoup moins. Les femmes reçoivent souvent pour le même travail au dessous de 10 Escudos par jour. Alors? Est-ce qu'il aurait été préférable pour le gouvernement d'augmenter d'abord le niveau de vie du peuple et mettre de l'ordre dans les finances ensuite? Je crois, qu'on avait raison de donner priorité à la réforme financière parce que seulement de cette manière on pouvait espérer reçevoir les moyens financiers necessaires pour pouvoir entreprendre la grande tâche d'élever le niveau de vie du peuple. Nous citons pour cela encore une fois le Président Salazar qui en 1948 a défendu cette priorité et qui a donné les raisons pour son attitude en 1928 [4]):

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[3] Oeuvre cité, p. 128/129. Nous soulignons quelques phrases.

„.... Le principe de la priorité de la réforme financière n'a pas été accepté pacifiquement, mais a été l'object de sérieuses controverses. Le plus grand nombre était d'avis que l'on donnât tout d'abord la préférence au développement de la production et que l'on s'attachât plus tard à rétablir l'équilibre financier sur la base large et solide d'une économie enrichie. Cette conception, inspirée chez nous de la doctrine du moindre effort, mais théoriquement défendable, oubliait un certain nombre de choses essentielles: l'une, que *la réforme des finances, dans l'absence absolument confirmée de crédits extérieurs et dans l'impossibilité de mettre en mouvement, dans des conditions acceptables, les capitaux nationaux, était indispensable pour le développement des travaux publics et pour l'exploitation des principales ressources du pays;* l'autre, que cette réforme, étant donné que la monnaie jouissait déjà d'une certaine stabilité de fait, venue de plus loin, était celle qui se traduirait le plus rapidement par des résultats tangibles; de plus, au point de vue de la défense de l'intérêt national, elle était celle qui nous semblait se revêtir de la plus grande importance et de la plus grande urgence. J'estimais, quant à moi, que l'on ne devrait y renoncer que dans le cas où il serait manifestement impossible d'équilibrer les comptes et d'assainir l'Administration. Mais j'avais la ferme conviction qu'à *la faveur de l'équilibre rétabli on pourrait demander au revenu national une contribution plus grande, et aux services publics un effort d'économie, sans préjudice*

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[4]) Oeuvre cité, p. 127/128. Nous soulignons quelques phrases.

de leur efficacité normale. L'instruction donnée, 'maintenant et d'un seul coup', a retenti comme l'ordre de franchir l'abîme et de construire sur la terre ferme..."

En effet, la question des crédits extérieurs a joué un rôle très important dans l'histoire des finances publiques portugaises. J'ai donné une description détaillée de ce rôle dans mon travail sur les possibilités du Portugal de reçevoir des crédits extérieurs, surtout des Etats Unis de l'Amérique du Nord, actuellement le pays le plus riche du monde. Ici il doit suffir de constater que le Président Salazar a toujours évité de faire des dettes à l'étranger pour ne pas subir les pressions éventuelles des créanciers économiquement et militairement très forts. Toutefois il est difficile à comprendre pourquoi le Portugal n'a pas essayé d'obtenir des capitaux dans les petits pays riches comme la Suisse, la Belgique, la Suède, pays neutres et pacifiques par tradition et parfois même forcés, comme par exemple la Suisse, d'exporter des capitaux pour augmenter leur rendement, qui est devenu trop bas dans l'intérieur du pays. Le Congo Belge a reçu pas mal de capitaux Suisses, pourquoi pas l'Angola ou le Mozambique, où sont déjà investis des capitaux Suisses dans des plantations de coco qui comptent parmi les plus grandes plantations de ce genre dans le monde. Le gouvernement portugais a dit maintes fois qu'il est prêt à accepter des capitaux étrangers mais en réalité il semble qu'il a empêché l'importation de ces capitaux toujours quand c'était possible, sans trop brusquer les intéressés. Ainsi on n'arrive pas à comprendre par exemple pourquoi le Portugal n'est pas encore membre de la Banque Internationale et du Fonds Monétaire International tandis qu'il est membre des Nations Unies. Jusqu'alors aucune banque, ni nationale, ni étrangère a pu briser le monopole néfaste de la Banque de l'Angola, monopole qui a déjà freiné trop et trop longtemps le progrès économique de cette Province qui a des possibilités de développement énormes. Une succursale de la banque portugaise „Banco Português do Atlântico" a ouvert ses portes en 1957, mais elle est loin d'avoir brisée le monopole de la Banque de l'Angola. Elle dépend d'elle et voit son activité restreinte d'escompter de bonnes traites. La législation en vigeur permets d'établir des banques étrangères dans les Provinces d'outre-mer portugaises, mais jusqu'alors seulement les deux banques britanniques „Barclays Bank" et „Standard Bank of South Afrika Ltd." ont ouvert chacune deux succursales en Mozambique, á Lourenço Marques et à Beira, banques commerciales seulement sans aucune intention ou possibilité de faire des affaires à long terme. Il y avait déjà des initiavives pour établir une banque étrangère en Angola mais la Banque d'Angola a une influence prépondérante à Lisbonne et a su s'opposer à ces projets avec succès. Tout au plus à cause de l'attitude hostile du gouvernement Salazar vis à vis des capitaux étrangers. On n'a pu oublier les mauvaises expériences d'autrefois. En 1948 le Président Salazar disait dans un discours [5]):

„...C'est pour moi, aujourd'hui encore, un sujet d'étonnement que seuls de très rares Portugais (tout au moins à ma connaissance) ce fussent aperçus de la valeur de l'oeuvre réalisée dans ce domaine (des finances). Et cependant, c'est à cause de ses mauvaises finances et son administration irrégulière que le pays a passé en jugement devant les prétoires de l'Europe, quelquefois non sans justice, d'autres fois à tort... Tout cela est de l'Histoire; et si ce passé, dont nous nous sommes efforcés d'effacer les unes après les autres les traces les plus humiliantes, ne doit pas créer une incompatibilité entre nous et le capital étranger, auquel nous devons beaucoup et dont nous avons fort besoin, il nous impose cependant, même au prix de grands sacrifices, une ligne de conduite qui ne puisse se retourner contre le pays, mais qui doit être au contraire un des facteurs de sa défense..."

Comme nous l'avons dit déjà, une des premières réformes financières du Président Salazar était la reconstitution d'un budget équilibré. Il est allé jusqu'à insérer l'article no. 66 dans la constitution de 1933, qui interdit de faire un déficit, et ordonne que le budget soit toujours équilibré. Il parait que l'équilibre budgetaire est une nécessité au Portugal par des raisons psychologiques. Un déficit aurait peut-être des conséquences néfastes pour l'Administration, qui commencera à gaspiller les fonds publics et aura bientôt oublié les leçons sur le thème „comment faire des économies" qu'elle avait appris pendant le régime Salazar. Il va sans dire que les économistes se demandent s'il sera possible de continuer avec cette politique dans les prochaines années pendant lesquelles on espère faire un progrès considérable avec l'industrialisation qui rendra l'économie portugaise plus sensibles aux cycles économiques avec leurs conséquences et leurs problèmes, comme par exemple chômage beaucoup plus grand, demande déficiente etc., circonstances qui demandent une politique financière anticiclique, par conséquent parfois non équilibrée. L'attitude du Gouvernement Salazar est difficile à comprendre. Citons d'abord un passage d'un discours du Prof. Fernando Emídio da Silva, Vicegouverneur de la Banque du Portugal, prononcé à la Sorbonne en Avril 1950, donc avant la Guerre de Corée [6]):

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[5] Oeuvre cité, p. 129.

„....Deux chemins pour investir se présentant à notre choix. Ou bien investir, sans porter atteinte aux finances saines, pour édifier sur elles? Investir, du reste, aussi, lorsqu'il y a des plans et des cadres... Ou bien, sous prétexte d'aller au plus pressé, ou au plus voyant, investir toujours et quand même? Peu importe, diriez-vous, le déséquilibre budgétaire. Il conduirait chez nous, plus vite qu'ailleurs, à l'instabilité monétaire et à l'affaiblissement du crédit public: c'est à dire, à compromettre les éléments sur lesquels il faut précisément compter pour investir. Vite, on glisserait sur la pente dangereuse. L'équilibre budgetaire, une fois rompu, on ne s'arrête plus facilement. Et quand il faut remonter le courant, des difficultés singulièrement accrues nous attendraient... pour arriver à l'état où nous en sommes. L'invraisemblable propos! Abandonnez ce point de repère annuel que rien ne remplace comme garant de l'Administration. Et proclamez ensuite que l'équilibre serait chose à atteindre dans un avenir plus ou moins incertain; entre-temps, que la consigne serait plutôt de dépenser. Mais descendons tous des nuages. Confiez une telle maxime, dans notre pays, à l'entendement et à l'observance des hommes. Ce serait une aubaine inespérée au service du gaspillage... Investissons autant que possible (c'est une toute autre question qui reste entière) à un rythme plus rapide, surtout mieux coordonné. Sachons aussi mieux profiter de la solide charpente de nos bonnes finances. Il y a bien, dans ces correctifs, de quoi rendre la situation actuelle nettement plus favorable. Mais pour le restant... essayons de garder les directives suivies, sans rien y compromettre. Elles sont été vingt-deux ans à l'épreuve, ce sont les plus difficiles, ce sont également les plus sûres. Du fait, nous servirons l'avenir, en y procurant comme de juste, plus de bien-être, plus de richesse, mais en le préservant aussi contre tout héritage abusif..."

Il est très prudent de la part du gouvernement portugais de ne pas tenter d'introduire de nouveaux systèmes, qui n'ont pas encore été à l'épreuve à l'étranger, dans les grands pays industrialisés. Mais avec le progrès de l'industrialisation il faut bien étudier le phénomène du chômage et les mesures qui sont appropriées dans ce cas, entre autres aussi le budget anticyclique. Pour le moment il ne sera pas encore indiqué à cause des raisons susmentionnées. On attend toujours les résultats d'une commission qui élabore déjà depuis 1953 une réforme profonde du système fiscal avec l'introduction d'un impôt progressif sur le revenu, la plus grande tâche de cette commission. On ne sait pas encore si la commission va introduire un impôt anticyclique. Je pense, qu'un impôt de ce genre peut rendre un grand service, surtout au Portugal et dans les Provinces d'outre-mer portugaises. La région monétaire ,,Escudo" est forcée de subir de violentes variations de prix du marché mondial parce que son économie dépend en grande partie de l'exportation de produits qui ont soufferts déjà maintes fois par des fluctuations très grandes de prix sur ce marché. L'Empire portugais n'a aucun produit d'exportation avec lequel il serait capable d'influencer la formation des prix sur le marché mondial comme par exemple le Brésil avec le café. Il est peu probable que les tentatives pour arriver à une stabilisation des prix des matières premières auront du succès parce que les activités dans ce domaine très important sont beaucoup trop faibles. La divergence des intérêts des producteurs, des commerçants et des consommateurs est trop grande. Jusqu'à maintenant seulement l'accord international sur la stabilisation du prix du sucre a eu quelques succès. Je n'ai pas de doutes que cette stabilisation est une nécessité primordiale pour l'économie des pays économiquement peu développés d'abord et pour les pays industrialisés ensuite. Dans le cadre de cet article il n'est pas possible de donner les raisons et je suppose, que cette stabilisation ne sera pas réalisable dans un proche avenir. Dans ce cas un système fiscal absolument neutre comme celui du Portugal va continuer à augmenter l'injustice qu'il représente déjà, parce qu'on a pas encore le principe .,,pay as you earn", payez à l'Etat selon vos possibilités financières. L'injustice augmente parce que les contribuables paient par exemple dans un an de crise, donc de prix bas, l'impôt avec le taux normal et ,,neutre" pour l'année de prospérité qu'on avait peut-être deux années auparavant, car le paiement pour cette période est dû seulement deux ans après le revenu soumis à l'impôt. Un impôt de ce genre est l'impôt de l'agriculture (Imposto de exploração agricola) dans les Provinces d'outre-mer portugaises. Il est fixé avec ce taux inflexible par une commission dans laquelle les contribuables sont représentés, après une évaluation de la production et de la récolte de l'année respective. Mais c'est d'abord le contribuable lui même qui donne les chifres de sa récolte à la commission et c'est évident qu'il donnera jamais les chiffres correctes. Le fisc n'a pas le droit de contrôler la comptabilité pour chaque évaluation, ce droit existe seulement s'il a de grands doutes que ces chiffres représentent une valeur plus ou moins approximative. Dans ce cas on a toujours une seconde comptabilité pour le fisc qui n'a pas le droit de faire une descente. Après avoir introduit le système „pay as you earn" il sera nécessaire d'élaborer un système de paiement de l'impôt à la source du revenu, paiement immédiat et variable selon le taux variable de l'impôt anticyclique sur le revenu qui sera fixé en considérant la conjoncture existante à l'époque du paiement de l'impôt. Il était déjà maintes fois nécessaire de décréter des impôts complémentaires, d'abolir certains impôts ou de payer des subventions parce qu'on avait pas un impôt sur le revenu anticyclique. Pendant la Guerre de Corée par exemple, avec les hausses considérables pour les produits d'outre-mer et les minerais, le Gouvernement Salazar a dû décréter un „impôt de survalorisation" (imposto de sobrevalorização) pour freiner l'exportation des capitaux (achats d'immeubles à New York etc.), de dépenses de luxe comme l'importation de voitures américaines luxueuses, construction de piscines, de maisons de luxe, voyages touristiques à l'étranger etc. Ces décrets no. 38659 du 28 février et no. 38704 du 10 mars 1952 ordonnaient que le fisc doit prendre les prix de 1949 comme base et considérer les augmentations des prix entre 1949 et 1952 comme survalorisation soumise au nouvel impôt. Après la déduction des impôts normaux, 20 % de cette survalorisation était due au fisc et du reste 40 à 50 % devaient être payé à un nouveau fonds de mise en valeur et colonisation (Fundo de Fomento e Povoamento) et 30 à 40 % de ce reste étaient aussi „gelés", mais pas soumis à quelques restrictions, donc destinés pour une libre disposition des contribuables lorsque le gouvernement considérerait opportun de les dégeler; par exemple dans une époque de crise donc d'une baisse des prix sur le marché mondial. Les moyens accumulés dans le nouveau fonds pouvaient être dégelés seulement quand le contribuable présentait un projet d'amélioration de son entreprise, d'un réinvestissement vraiment bien étudié et rationnel. Comme il est peu probable qu'un contribuable dépense son argent dans une époque de crise pour des projets de luxe, on avait assuré que les moyens immobilisés qui restaient à la libre disposition des contribuables, après être dégelés dans une époque pareille, trouvaient un emploi plus avantageux pour l'économie nationale. Il va sans dire que les contribuables protestaient contre ces mesures du Gouvernement Salazar et après peu de temps avec raison parce que les prix mondiaux commencaient à baisser déjà dans l'année même de la promulgation des décrets susmentionnés. En défense du gouvernement on doit ajouter cependant, que les contribuables faisaient encore pas mal de profits, même après le paiement du nouveau impôt, parce qu'ils gagnaient encore beaucoup à cause de la hausse des prix entre 1945 et 1949, déduction faite de la baisse de 1948 et 1949. Mais jusqu'au mois d'avril 1953 l'augmentation des prix à cause de la Guerre de Corée était déjà éliminé; toutefois, les prix ne tombaient pas au dessous du niveau de 1949.

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[6]) Revue de Science et de Législation financières, Paris, 2. Trim. 1950, no. 2, page 167/168.

Dans les temps de prix bas le gouvernement portugais a souvent décrété l'abolition des taxes d'exportation respectives comme par exemple actuellement pour le sisal qui souffre déjà depuis l'automne 1952 d'une baisse permanente catastrophale, ne laissant aux producteurs qu'un lucre minime ou pas de profit du tout et pour les actionnaires ça signifie la suspension permanente du paiement de dividendes. En février 1952 le prix de sisal était encore 16,50 Escudos par kg en Mozambique et en automne de la même année il tombait jusqu'à 5 Escudos, justement le prix qu'on paie par exemple maintenant (1-1-1959) en Angola (fob Luanda). Mais la baisse allait déjà au dessous de 4 Escudos! Les raisons pour cette baisse sont la surproduction, la politique de dumping du Brésil, où l'Etat paie des subventions considérables aux producteurs qui produisent encore de la qualité inférieure (production en petite échelle) et la politique monopoliste des six grands grossists à Londres. On se demande dans ces circonstances et aussi en pensant au système d'impôts anticycliques si on n'aurait pas mieux fait de distribuer les fonds qu'on a accumulé pendant les temps de prospérité aux producteurs nécessiteux — comme maintenant les producteurs de sisal — pendant les temps de crise. Mais, de l'autre côté on donnerait peut-être des subventions aux producteurs qui produisent un article qui ne trouve plus une demande quelconque, donc un article qui ne vaut rien. La difficulté est seulement: qui sait par exemple maintenant si le temps du sisal est passé ou non? Ne faut-il pas laisser la décision au marché et laisser la perte de capitaux investis entièrement aux producteurs de l'article mort?

Il y a encore une question qui se pose dans le domaine des impôts aussi bien que dans le domaine des emprunts publics: comment est-il possible d'intéresser les contribuables et les capitalistes (lesquels on veut animer d'acheter un titre de l'Etat) de payer? Au Mexique, par exemple, on ne vend aucun titre d'Etat sans indiquer le but pour lequel le produit de cet emprunt est destiné. Au Portugal on n'a pas encore adopté cette méthode qui a donné de bons résultats au Mexique. En Angola [7]) tous les producteurs ont un grand intérêt pour la construction des routes, un oeuvre qui peut valoriser beaucoup leurs plantations. Serait-il trop de demander un sacrifice de ceux qui sont tellement intéressé dans l'exécution de ces travaux publics? Un „impôt de routes" sur les revenus d'abord et une „taxe de routes et de ponts", pour ceux qui les utilisent ensuite et financement avec des „emprunts de routes" sera certainement pas accepté avec une si grande indignation et de mauvaise grâce comme l'impôt de survalorisation susmentionné.

En tous les cas: nous sommes très curieux de savoir les résultats de la commission qui s'est occupée avec la réforme fiscale pendant les dernières années!

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[7]) Le régime fiscal au Mozambique j'ai décrit dans une monographie sur ce pays édité en 1958 par la „Deutsche Afrika-Gesellschaft" à Bonn. Le volume sur l'Angola a paru en avril 1960.

CAPITAL FORMATION BY FISCAL MEASURES IN THE PORTUGUESE EMPIRE

by RALPH von GERSDORFF

SUMMARY

The object of this article is to show how capital formation by fiscal measures takes place in the Portuguese Empire, to inform about the problems, the policies applied to solve them and to make critical remarks about these policies as well as proposals on the ground of the analyses. The article is meant to supplement the still unpublished studies of the same author about the "Financial Reforms of Premier Salazar" and the "Economical Problems of Portuguese Africa and Proposals for their Solution" as well as the already published books about "Measures to Promote Private Capital Formation in the Portuguese Empire: Saving Possibilities and Financing Methods in Underdeveloped Areas" (publishers: Polygraphischer Verlag, Zürich, Switzerland, 1958), about Angola and Mozambique, edited by the "German Africa Society" at Bonn, W. Germany.

Is there really a big scarcity of capital in the Portuguese Empire? The answer has to be yes, but it is a scarcity "sui generis" because the banks show an extraordinary liquidity, unique in Europe. Liquidity legislation has been severe and the depositors themselves prefer to keep their property as sight deposits. Political, monetary, public finance and balance of payments conditions are stable or favorable and the debit interest rate level is very low but the private economy did not profit enough by these advantageous investment conditions, not enough at least for the highly productive sectors of the national economy. Preference is given to investments in the building trade, the acquisition of real estate, hoarding and luxury expenses. Saving is not sufficiently stimulated because the credit interest rate level is too low, no saving propaganda, information and education campaigns are launched and in Portuguese Africa there is even a lack of saving institutions. It seems thus that capital formation can only be increased by efficient fiscal measures.

For the understanding of the present Portuguese fiscal system it is is necessary to study the financial reforms of Premier Salazar. These reforms have been made according to the "classical" pattern

of the good housewife: abolition of the budget deficits by increasing revenue — even some new taxes were decreed — and decreasing expenditure, extinction of the floating debt which had an inflationary effect, lowering of the interest rate level of the consolidated public debt by successive conversions, accelerated redemption of the foreign-held debts and regaining of the shaken confidence of the creditors of the state. Because of the "Latin mentality" in this respect, which does not like the control of the private finance by the state, the classical income tax according to the principle "pay as you earn" was not introduced in the Portuguese Empire by Salazar. On the contrary, he abolished and recreased some taxes after the financial reforms have been carried out and public finance functioned "normally" according to his opinion.

Since the financial reforms of the thirties the fiscal system remained more or less unchanged, thus also the per capita tax revenue and the fiscal burden including social insurance (total revenue collections) in relation to gross national product; the former is 10 to 15 % of the latter (other OEEC countries: 30 % and more). As private capital formation is insufficient, capital formation by fiscal measures must be expanded. In view of the scarcity of capital a commission was constituted in order to work out a new fiscal reform, but till now nothing has been published what could be called a thorough reform. Under the present regime it is even very unlikely that such a reform will ever be decreed because two of the four classes which are the strongest supporters of this regime, the industrialists and the big landowners are favoured by it to a very large extent. As the other two classes, the army officers and the clergy, will not get higher incomes after a fiscal reform and they always get sufficient public funds for their various projects, they are not interested in any reform. At least it will be necessary to decree a profits-tax according to the British pattern and a tax on the purchase of luxury goods, e.g. similar to the Swiss "Luxury-Tax".

The above mentioned two classes (industrialists and big landowners) were already favoured before the Salazar regime by inflation and during World War II when Salazar was not able to avoid the "imported inflation". Although the value of the Portuguese currency has been kept fairly stable in the other periods, even during the Corea-boom, the national income and savings could not be increased sufficiently. In many years the increases of national income were only equal and in others only slightly higher than the growth of the population. Tax receipts were too meager to allow very big productive government expenditure in order to achieve a major increase of national income and large amounts of foreign capital were not permitted to be invested in the Portuguese Empire because of bad experiences in the pre-Salazar times. In spite of the excellent conditions which Portugal can offer to foreign investors since the thirties these chances to get foreign capital have not been used by the Salazar regime only because of the fear that more of these experiences can be made (political and military pressures of foreign creditors), an attitude which is not comprehensible e.g. in respect of Swiss capital which contributed so much already to the economic development of many countries, also of the underdeveloped Belgian Congo. Only in September 1959 Lisbon applied for membership in the International Monetary Fund and the International Bank for Reconstruction and Development!

As the Portugese Empire with proceeding industrialization will get more and more into the problems of unemployment and as it suffers by the often very violent fluctuations of the world market prices of many of its most important export products, it is doubtful wether the strict orthodox budgetary equilibrium policy can be maintained and all the modern scientific knowledge about anticyclical budgeting in public finance can be constantly disregarded. What is also urgently needed is a proper anticyclical income tax according to the principle "pay as you earn" and the business cycles, payable at the source of the respective income. In Portuguese Africa some special taxes should be decreed, e.g. for the financing of the building of roads by levying tolls on roads and bridges. The latter is done already in Portuguese India. With the same object so-called "road-loans" could be launched, just as in Mexico, where these and other loans with the announcing of the specific aims to be reached by them, were a big success.

LINEAR PROGRAMMING AND PUBLIC FINANCE

by DOUGLAS DOSSER

University of Edinburgh

I

Two articles ¹) have appeared in recent numbers of this journal purporting to be "the first trial for the application of linear programming to public finance". ²) This statement can only be substantiated if we take an extremely narrow view of the problems dealt with in this branch of economics. Indeed, the birth of linear programming techniques took place in the allocation of government expenditure on air defence among the competitive, multifarious, activities of the United States Air Force. ³)

This article attempts a critical review of the applications so far made of linear programming to problems in public finance and examines its potentialities. For this purpose, we make a distinction between the income side of the government budget, and the expenditure side.

The applications to be considered on the income, or tax-raising, side are the work of Miss H. Makower ⁴) and Professors Fossati and Cutolo. ⁵) We examine this side first.

On the expenditure side, it is more a matter of the potentialities which require discussing. This we shall turn to secondly.

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¹) E. Fossati, "For the Application of Linear Programming to Public Finance", *Public Finance,* 1957, No. 2; I. Cutolo, "An Application of Linear Programming to Public Finance", *Public Finance,* 1958, No. 3.

The second article is founded on the suggestions contained in the first.

²) Cutolo, op. cit., p. 216.

³) G. Dantzig's celebrated article "Maximisation of a Linear Function of Variables Subject to Linear Inequalities", arose out of his work for the United States Air Force in 1947. It was published in 1951 in T. C. Koopman's (ed.), *Activity Analysis of Production and Distribution* (New York, 1952).

⁴) See H. Makower, *Activity Analysis and the Theory of Economic Equilibrium* (London, 1957), Chapter VIII.

⁵) Op. cit.

II

Makower has re-examined the direct-versus-indirect tax controversy in the light of programming techniques. The well-known proposition that direct taxes are supposed to interfere less than indirect with some non-tax optimum allocation of resources can be represented quite simply in terms of programming or activity analysis. This Makower shows, but it was admittedly not possible to advance the analysis by programming techniques. The usual difficulties which arise when a transfer is effected from a "one-man economy" to a whole community, concerning "whose welfare is to be maximised", are not escaped by the programming formulation. We cannot report any startling success for programming in this problem.

We turn to the Fossati-Cutolo model for the treatment of public finance problems by linear programming techniques. Our treatment of this model will be rather critical; we consider that it is addressed to a rather artificial problem, and that it makes some rather odd assumptions.

The Fossati-Cutolo model tackles the problem of minimising administrative expenses of meeting a given regional demand pattern for government services, given a regional pattern of taxable capacities. The variables and parameters in the problem are as follows:

(i) Constant parameters: the unit cost of tax collection by each method of collection in each region; the unit cost of transfer from region to region; the taxable capacities in each region; the demands for public services in each region.

(ii) Variables: the amounts of income raised by each method in each region, subdivided by regions to which transferred.

If there are q tax collection methods in each of p regions we have p^2q variables. The taxable capicities are specified in respect of each tax collection method in each region; so these form pq restraints. The regional demands to be satisfied form a further p restraints. The optimal programme will specify a complete tax collection and transfer pattern, the cost of which is to be minimised. We thus have to minimise a function of p^2q variables, subject to $pq + p$ restraints (and nonnegativity of the variables), which is a standard linear programming problem.

The model can be criticised as regards content, and, as a result of that, as regards form. Let us look at the economics behind the model. We shall discuss in turn the question of regions, the costs of collection and transfer between regions, taxable capacities, the demands for public services, and the implied budget position.

Regionalisation in the model would appear a severe restriction. In the case of demand for public services, many of these could not be treated as regional demands. Such is the case with defence, general administration, and other major items of government expenditure. Even in the case of roads, the benefit would hardly be attributed solely to the region in which they are located. On the income side, where taxable capacities are set, it would seem more meaningful to divide all tax-payers by some other criteria than location, such as income-group. But if we did this, we would cease to be interested in costs of transfer, which is at the heart of the model.

It might be possible to regard each individual as a "region", with its individual demand for public services and taxable capacities; we might be able to bring into the model the question of redistribution of income. But this seems ruled out by objections to be discussed, and by a particularly fundamental one.

The costs of collection and transfer included in this model are strange conceptions. They must be referred to in money terms for the government could hardly provide precisely the type of goods demanded in a particular region from tax-in-kind in *any* region. When we do interpret these costs in money terms, the costs of collection are real enough, though only a small proportion of the whole tax, but the costs of transfer are surely only book transfers effected through the banking system, and negligible in amount. The whole model, therefore, seems addressed to a very minor problem.

Taxable capacity is a dubious concept at the best of times, but it is weaker here because it is divorced from the demands for services in a region. How would the tax-payers in a region react if they knew they would get their demands for services met from funds from other regions, if only they resisted attempts by the authorities to raise taxes from themselves?

It is in this relation between taxable capacities and the demand for services, that the most fundamental weakness of the model lies.

To turn back to the technical situation for a moment, we find that to convert to equalities the pq restraints stating that taxable capacities in each tax collection method in each region must not exceed given taxable capacities, needs the introduction of pq "slack variables". The problem [6] is thus converted into minimisation of a function of $p^2q + pq$ variables, subject to $pq + p$ restraints.

These "slack variables" represent excess or unused taxable capacities in regions. Now they lead to serious difficulties, for surely we must assume that regions whose taxable capacity is reached will increase their demand for public services, knowing that the funds will come automatically from other regions. To exclude this possibility, we should have to assume complete ignorance or lack of optimising behaviour on the part of the tax-payers of regions.

What does this mean for the Fossati-Cutolo model? The "slack variables" do not appear, for all the restraints will be written as equalities, as all taxable capacity is used up. But further, the total demand for services is now determined by total taxable capacity, i.e.

$$\sum_{r=1}^{p} \sum_{h=1}^{q} \overset{(h)}{\alpha_r} = \sum_{s=1}^{p} \beta_s$$

where $\overset{(h)}{\alpha_r}$ is the taxable capacity of region r in respect of tax method h, β_s is the demand for government services in region s.

In fact the model now becomes

$$\text{Minimise} \quad Z = \sum_{h=1}^{q} \sum_{r=1}^{p} \sum_{s=1}^{p} \overset{(h)}{c_{rs}} \overset{(h)}{\lambda_{rs}}$$

$$\text{Subject to} \quad \sum_{s=1}^{p} \overset{(h)}{\lambda_{rs}} = \overset{(h)}{\alpha_r}$$

$$(r = 1, 2, \ldots, p;\ h = 1, 2, \ldots, q)$$

$$\sum_{r=1}^{p} \sum_{h=1}^{q} \overset{(h)}{\lambda_{rs}} = \beta_s$$

$$(s = 1, 2, \ldots, p)$$

where $\overset{(h)}{\lambda_{rs}}$ is the amount deducted from income in region r by tax method h and transferred to region s; and $\overset{(h)}{c_{rs}}$ is the cost of each such collection and transfer.

The problem is now to determine a set of p^2q non-negative values (instead of $p^2q + pq$) of which not more than $pq + p - 1$ need be positive (instead of $pq + p$).

However, we are not so much concerned with the form of the model, to which we have made but a slight amendment, but its economic content.

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[6] This is due to our assumption that total taxable capacity equals total demand for services, which renders one constraint redundant.

We did notice that the costs of transfer would be slight and that taxable capacity is a questionable concept. But our main criticism of the economic content of the model arises from the determining role of taxable capacities: that we really must assume that demand for services will expand to meet the taxable capacity available. This excludes from the tax structure considerations of equity and efficiency.

Equity is excluded because whilst any region, through any tax method, is capable of any further exploitation, the funds will be called up for the benefit of some other region.

Of course, the "benefit" view of taxation is ruled out, as the marginal benefits in any region due to increased public services are quite divorced from marginal tax payments.

As regards efficiency, the tax system cannot be used efficiently for the attainment of any objectives other than fund-raising; i.e. the use of taxes as anti-cyclical devices, or to preserve external balances. For such purposes, the tax must be aimed at particular sections of the community, defined by income-groups or spending habits; this is not consistent with taxation determined entirely by "determination-to-resist", which is what taxable capacity here implies. Even when such objectives are put out of mind, and taxation is regarded solely as a means of providing certain goods publicly, it could be argued to be inefficient, as there is no balancing of marginal costs and gains within a taxed-benefit-receiving group (i.e. a region).

One can only conclude that the model sets out to treat a minor problem, and makes some strange assumptions about fiscal systems on the way.

III

We turn now to applications of linear programming to public finance on the expenditure side of the government budget. Two types of application suggest themselves:

(i) We assume a fixed budget (the whole budget or the amount set aside under some particular head), and we allocate expenditure under sub-heads to maximise some defined objective function.

(ii) We assume fixed objectives to be met, and minimise the costs of meeting them.

Such applications as have been made refer to defence rather than civil expenditures. If we characterise government expenditure problems as those where no reference is possible to markets (or profits) in the maximising procedures we must exclude work proceeding on allocation problems in nationalised industries — merely big firms, for this purpose.

We shall try to illustrate some of the potentialities and problems of the two approaches outlined above, paying attention to the civil [7]) side of the budget.

In the first kind of approach, the greatest difficulty arises over what we are to maximise. We can assume that the typical problem is one in which no market price attaches to the government product. In linear programming terms, we are in difficulty about the specification of the parameters in the objective function. One possibility, applicable in certain cases, might be to use electorate-satisfying. or vote-catching, coefficients. Thus if we have a particular appropriation in mind for welfare services, we might have an objective function such as this to maximise:

$$Z = V_1x_1 + V_2x_2 + \dots + V_nx_n$$

where x_i ($i = 1, 2, \dots, n$) are real outputs of baby foods, hospital beds, real value of old age pensions, etc., and V_i ($i = 1, 2, \dots, n$) their respective vote-catching index per unit of output.

The restraints in this set-up would involve the call on the government's fixed resources; that is, if the government is planning for one fiscal year, they would involve those resources whose supply could not be materially increased during the year, such as hospitals. Alternatively, we might take account of the possibilities of government use of resources at present partly owned by the private sector. Thus if the number of doctors is a restraint on the expansion of health services, the capacity might be expressed not as the number in present government employ, but by the total number in the country.

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[7]) For references to the military applications especially, see "Economics and Operations Research: A Symposium", *Review of Economics and Statistics*, August, 1958.

We might have sets of restraints, beginning with a set of this nature.

$$\sum_{j=1}^{n} a_{kj}\, x_j \leq h_k \ (k = 1, 2, \ldots, m)$$

Here, a_{kj} specifies the demand on capacity k per unit output of x_j. Further, the constants h_k $(= 1, 2, \ldots, m)$ are the capacities in respect of hospitals, administrative buildings, processing plants of government contractors, etc.; they can be interpreted strictly as present capacities, or as the amounts of such factors the government might reasonably preempt for its own use during the year, without undesirable effects on the private sector (or, if one likes, on such things as dollar balances and regional unemployment). Most of the coefficients a_{kj} $(j = 1, 2, \ldots, n;\ k = 1, 2, \ldots, m)$ will, of course, be zero.

Next, it would seem necessary to include a set of restraints stating that present standards, at least in some welfare services, must be maintained. It might be realistic to programme a lower hand-out of vitamin pills for expectant mothers, or even some decline in medical services. But it would probably be quite unrealistic to programme lower old age pensions. So we have:

$$x_i \geq c_i \qquad (i = 1, 2, \ldots, n)$$

The c_i $(i = 1, 2, \ldots, n)$ represent minimum standards; they may in some cases be set at present levels, or at some lower levels, or at zero. It will be noted that they ensure non-negativity of outputs which is required in programming problems.

Finally, each unit of each possible welfare service is, it is assumed, associated with a cost, and the total cost must not exceed the welfare appropriation in the budget:

$$p_1x_1 + p_2x_2 + \ldots + p_nx_n \leq W$$

where p_i $(i = 1, 2, \ldots, n)$ are unit costs, and W the welfare appropriation. Discretely rising costs could be introduced in the usual way, by allowing only limited "runs" of, say, x_1 at cost $p_1^{(1)}$, subsequent "runs" costing $p_1^{(2)}$.

The solution to this problem 8) would give the maximum imputed

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8) There may be no feasible solution if the total cost of the minimum standards for all services exceeds the welfare appropriation.

vote-catching return to a given welfare allocation of funds. The last restraint will probably become binding (all funds spent), but there is the remotest possibility that the capacity restraints would inhibit this.

On statistical implementation, the W, p_i, a_{kj} and h_k are technologically-given parameters; the political art of using the model would enter via the estimation of the V_i and, to a lesser extent, the c_i.

Turning now to the second type of approach, we are faced with the problem of meeting fixed objectives at minimum cost. Using the illustration of welfare provisions again, the objectives, g_i $(i = 1, 2, \ldots, t)$ are specified in terms of such parameters as number of hospital beds, extent of general medical practice, etc.; or, possibly, as "success indicators" like infant mortality rates, working days lost through sickness, etc. Reaching each of these objectives requires the State to purchase the services of doctors, nurses and other services, and to purchase goods like drugs, orange juice, blankets, etc. The optimal programme will state the set of such purchases, x_i $(i = 1, 2, \ldots, n)$ which will allow at least the attainment of the objectives at minimum cost.

The objection function is thus to minimise the total cost, W^1 of the set of purchases x_i each costing p_i $(i = 1, 2, \ldots, n)$.

Minimise $W^1 = p_1x_1 + p_2x_2 + \ldots + p_nx_n$. There are two sets of restraints, a set of demand restraints, and a set concerning supply (plus the usual nonnegativity requirements). The demand restraints express the technological requirements, in a matrix of coefficients $[b_{li}]$ in respect of the objectives,

$$\sum_{i=1}^{n} b_{li}\, x_i \geq g_l \quad (l = 1, 2, \ldots, t)$$

Here, b_{li} specifies the unit contribution to g_l by x_i. The supply constraints indicate that the total call on x_i on account of the pursuance of the total of objectives must not exceed the present or expected capacity in respect of that x_i (Let these capacities be denoted $\overline{x}_i$ $(i = 1, 2, \ldots, n)$.) Thus we have n further constraints:

$$x_i \leq \overline{x}_i \qquad (i = 1, 2, \ldots, n)$$

It is assumed in this model that only one price, p_i, pertains to the purchase or production of any one welfare "good". We could take account of discretely rising costs, just as before, regarding the same good bought at different prices as different goods.

In the previous model, we explicitly included reference to the electorate-satisfying potentials of different welfare expenditures. This aspect is implicitly present here, for the pre-determined objectives can be assumed chosen to maximise the political benefit from the expenditure.

Of the two approaches outlined in this section, that of maximising the return subject to budget constraints, and that of minimising costs given the objectives, which is potentially more useful? It depends on the decision-making procedure of governments. Probably the first approach is more realistic, for governments are likely to decide on a year's welfare appropriation as a whole; the most likely occurrence is that the same global total as last year is allocated to welfare, written up or down some % according to current economic and political conditions in the coutry.

IV

The formal symmetry between the Fossati-Cutolo model and our second model, minimising the cost of meeting given objectives, will have been noticed. Both have a cost-minimising objective function. There are demand restraints and capacity restraints in each case. There are, however, three differences. Firstly, whilst we argued that demands would expand to meet the taxable capacity available in the Fossati-Cutolo case, there is no analogue in our model, since demands can legitimately be assumed to be fixed exogenously (taxable capacities may again be the determining factor, but then taxable capacities are exogenous to our model). Thus we leave the constraints as inequalities in our system. Secondly in the Fossati-Cutolo problem, we were able to impose an overall equality between the sum of the constraining constants in the demand constraints and in the supply set. There is again no analogue in our last model, either from the point of view of economic sense, or commensurability of units. Third and lastly, all the constraints in our model do not contain only unitary coefficients. Whilst, in the Fossati-Cutolo problem, a pound or lira from whatever region contributed the same amount to the satisfaction of demands, we must take account of the fact that one doctor contributes differently to the achievement of a medical standard than does one nurse. These aspects remove our problem from that class of linear programming applications labelled "transportation" cases, to which Cutolo's belongs. It is correspondingly more difficult to solve.

Our final conclusions on the Fossati-Cutolo work are as follows. We have taken the liberty of making some formal changes, and given this, we do not quarrel with the model as a mathematical edifice. However, the problem it treats is a minor one, but worse, it is underlain by a strange and unrealistic method of tax imposition.

At the outset, we made a distinction between applications of linear programming in public finance, on the income side of the budget and the expenditure side. By the symmetry of the Fossati-Cutolo model and one of our own on the expenditure side, the distinction is seen as artificial. This only adds point to our remarks concerning the past uses of linear programming in public finance, which Cutolo suggests are non-existent. His own model is now seen as a problem in government expenditure, and this is where linear programming began, in a consideration of objectives and resources in governmental military planning.

LA PROGRAMMATION LINEAIRE ET LES FINANCES PUBLIQUES

par DOUGLAS DOSSER

RÉSUMÉ

Récemment, Fossati et Cutolo ont formulé un modèle de la Programmation Linéaire minimisant le coût total des services publiques d'une composition régionale donnée, étant donné les capacités imposables des régions. Ceci représente d'après les auteurs un premier essai d'application de la P.L. en Finances Publiques.

L'auteur questionne le modèle et ses prétentions. Le modèle traite un aspect d'une importance plutôt secondaire et contient des suppositions fort irréalistes. Contrairement à l'affirmation, les premiers développements de la P.L. étaient en conjonction avec les problèmes de répartition des dépenses publiques entre les différents projets de défense militaire.

En plus de ses points fondamentaux, l'auteur suggère quelques modifications techniques au modèle Fossati-Cutolo et propose lui-même quelques modèles concernant la maximisation du rendement d'une dépense donnée. Le rendement dans ce contexte n'est pas interprété dans des termes monétaires, mais plutôt dans le sens de maximisation des résultats électoraux. L'art politique demeure consistant en l'évaluation des coefficients de ce maximum. Néanmoins, la P.L. pourrait contribuer à établir un tableau plus général, tenant compte de toutes les possibilités et limitations des ressources.

THE NORWEGIAN SYSTEM OF TAXATION 1958

by OLAV HAUAN
Trondheim

The Central Bureau of Statistics of Norway has recently worked out a publication with the intention to describe the present system of taxation in Norway. It is divided into four main sections. Section I deals with definitions, classifications and principles which appear to underlie the Norwegian system. This section gives, in addition, a brief historical survey and a picture of the present structure of taxation. Section II deals with incomes and property taxes, section III duties, and section IV social security premiums. Other sources of public revenue, for instance fees, surplus of public enterprice, fines and confiscations, are excluded from this survey.

From an administrative point of view taxes may be divided into two main groups, taxes collected by central government and taxes collected by municipalities. Central government taxes may furthermore be classified into:

> Taxes on the budget accounts' (The Norwegian State budget does not include all receipts and expenditures of the state.)
> taxes to public funds and
> taxes to social security agencies.

The total amount of tax revenue in 1956 was approximately 7500 mill kr. or 31,1 per cent of the net domestic product. Some more than two thirds of the amount (5133 mill. kr.) was collected by the central government. Broadly speaking, nearly a third of the taxes on the budget accounts (1188 mill. kr.) are income and property taxes, a third general sales tax (1515 mill. kr.) and some more than a third other taxes and duties (1643 mill. kr.). A very large part of the revenue from other taxes and duties is derived from five major sources, customs duties (363 mill. kr.) duties on alcohol (433 mill. kr.), on tobacco (299 mill. kr.), on chocolate (104 mill. kr.) and on gasoline etc. (241 mill. kr.). The rest of the duties are numerous, but individually of lesser importance.

The local government's principal source of revenue is the tax on income and property. In 1956 the proceeds of these taxes were 2310 mill. kr. or about 97 per cent of the total tax-receipts of the municipalities.

1. INCOME AND PROPERTY TAXES

Income and property taxes in force are as follows:

- Central government taxes
  - Ordinary income tax
  - Ordinary property tax
  - Tax on undistributed profits
  - Old age and war pension tax
- Municipal taxes
  - Ordinary income tax
  - Ordinary property tax
  - Surtax charged on higher incomes.

Income taxes (and property taxes) are taxes not only on the income of individuals but also on the income accruing to and retained by corporate bodies. The same income- and property estimations form broadly the basis for all the taxes. According to the tax laws, interest on capital, pensions, and any advantage derived from property work or activity, whether continuing or once and for all, constitutes income. In principle, all expenditures in acquiring the income can be deducted.

Wage and salary earners may, instead of deducting the various expenditures, subtract 6 per cent of the wages as a standard deduction. The maximum standard deduction is 1000 kr. and minimum deduction 200 kr.

In practice, trading profits are computed for tax purpose broadly on ordinary commercial accounting principles. Particularly important deduction items are allowances for deprecation on capital intended for permanent use. The depreciation allowances should according to Norwegian rules correspond to the real decrease in value. In practice the basis of the writing off is historical cost and the method of straight line is generally used. Depreciation rates vary with the types of assets. 10 per cent is a common rate for machines, 2—3 per cent for buildings and 6—8 per cent for ships. — With some exception an additional allowance is available. (Exceptions are for example cars, offices shops, hotels etc.) This additional allowances may be claimed for the year in which the assets is brought into use and four subsequent years, at the rate of 50 per cent of the normal annual allowance subject to a maximum of 2 per cent of the historical cost of the asset in any year.

As an alternative an initial allowance may be claimed, in addition to the normal annual allowance, of 25 per cent of the cost in excess of 500.000 kr. (For ships and aircraft 25 per cent of the total cost.) This allowance may be spread over the period, beginning with the year in which construction has begun, up to and including the fifth year of operation of plant. The allowance may not exceed 50 per cent of the assessed income in any year.

Property tax is assessed from the net property of the taxpayer. The tax laws contain the following regulations about the estimation of property: "The property is estimated to a sum which, on the 1st of January in the year when the assessment is made, represents according to regular prices the real value of real and personal property and due claims when incumbent debts are deducted." The value of movable property belonging to personal taxpayers (except cars and pleasure yachts) do not come under taxation if it does not exceed the amount of 20.000 kr.

Municipal taxes. The ordinary income tax to the municipality amounts to a fixed tax rate of the taxable income — i.e. assessed income less possible tax-free deduction. The tax-free deduction varies according to the tax class to which the taxpayer belongs. In tax class 0, which comprises companies and persons who have acquired class deduction by taxation in other municipalities, there is given no deduction. Single personal taxpayers are usually placed in tax class 1, taxpayer having one dependent in tax class 2, etc. Married people are adressed jointly, but if both have an income, certain deductions in assessed income are granted (from 600 to 1500 kr.). The municipality may to a certain extent decide how great the tax-free deductions should be. The law requires, however, that the cost of living in the municipality must be taken into consideration. Even if this regulation is not too seriously respected, the Ministry of Municipal Affairs must in most cases acknowledge the tax-free deductions, and at any rate the municipality may only choose between seven deduction tables.

The rural (or urban) municipality choose between these tax rates: 14, 15, 15,5, 16, 16,5, 17, 17,5 and 18 per cent. In order to apply the highest rate it is necessary to have the consent of the

Ministry of Municipal Affairs. The municipality has the opportunity of deciding that sums up to a certain limit should be entirely exempted from taxation. This sum may amount to 40 per cent of the tax-free deduction in class 1 in addition to the ordinary tax-free deduction.

The municipal property tax shall, according to law, represent between 1 per thousand and 4 per thousand of the taxable property. At present practically all municipalties apply the maximum rate. For personal taxpayers, only properties exceeding kr. 5000,— are taxed.

The municipal sur-tax on higher income is collected according to the same rates all over the country, and the tax-free deduction is also settled accordring to indentical rules. The rates for the sur-tax are:

Of the first kr. 20.000 taxable income: 0 per cent
„ „ next „ 20.000 „ „ : 3 „ „
„ „ „ „ 30.000 „ „ : 4 „ „
„ additional amounts „ „ : 5 „ „

Central government taxes. Different tax rates for different groups of taxpayers are in force for income and property taxation to the state. Two groups of taxpayers are financially of great importance, viz. personal taxpayers and joint-stock companies.

Personal taxpayers are, as in the local taxation, placed in tax classes. But instead of deduction in assessed income, there is given deduction in tax as regards the income tax to the state. The tax deduction is for the various classes

	Class 0	Cl. 1	Cl. 2	Cl. 3	Cl. 4	Cl. 5	Cl. 6	Cl. 7	Cl. 8
Kr.:	100	400	800	1000	1300	1700	2200	2800	3500

The tax rates are progressive, as shown in the table below:

Assessed income:	Tax rates:
Of the first kr. 15000:	10 per cent
„ „ next „ 7500:	15 „ „
„ „ „ „ 7500:	25 „ „
„ „ „ „ 10000:	35 „ „
„ „ „ „ 30000:	45 „ „
„ additional amounts :	55 „ „

The property tax personal taxpayers is also progressive. Property tax is only taken from that portion of the property which exceeds certain amounts. For taxpayers in tax class 0 no deduction is given, but only property above kr. 5000,— is taxed. For taxpayers in class 1 the deduction is kr. 15000, and for other taxpayers it is kr. 25000. The tax rates are as follows:

Taxable property:	Tax rates:
Of the first kr. 20.000:	2,5 per thousand
,, ,, next ,, 30.000:	5,0 ,, ,,
,, ,, ,, ,, 50.000:	7,5 ,, ,,
,, ,, ,, ,, 100.000:	10,0 ,, ,,
,, ,, ,, ,, 100.000:	12,5 ,, ,,
,, ,, ,, ,, 200.000:	15,0 ,, ,,
,, additional amounts :	17,5 ,, ,,

Up to the total state income tax and up to half of the state property tax may — after application — be relinquished if the total taxes on income and property amounts to more than 80 per cent of the income (the percentage being estimated by adding the marginal rate for state income tax and the average rates for other taxes).

The income tax and property tax of joint-stock companies to the state are estimated according to fixed rates, so that the taxation becomes proportional. The rate for ordinary income tax is 30 per cent, where as the rate for property tax is 2 per thousand. In addition to the ordinary income tax to the state, he companies pay a fund tax of 8 per cent of the so-called fund income. The fund income is: Total income less disbursed dividends less deposits for reserve funds prescribed by law. (The reserve fund prescribed by law may amount to as much as total debts less the stock capital; and in any case at least 20 per cent of the stock capital.) Contrary to the rules of many other countries fund savings are taxed stricter than that part of the company income which is distributed as dividends. This is, however, true only when one regards the taxation of the company isolated. In the state tax assessment income of stocks cannot be held outside the taxable income of personal taxpayers as in the local taxation. Disbursement of dividends are therefore as a rule taxed twice for the benefit of the state — first in the hands of the company and afterwards in the hands of the personal taxpayers.

Apart from the rules for (ordinary) personal taxpayers and (ordinary) joint-stock companies, the Norwegian state tax enactment has separate tax rules for: sailors, co-operative purchase-societies, savings banks and mutual damage insurance companies, housing companies, municipalities, mutual life insurance companies, foreign joint-stock companies, foreign stock-Owners in Norwegian companies.

Old wage pension and war pension tax are income taxes which for personal taxpayers are assessed on the whole net income. Persons older than 69 are exempted. The rate is at present 2,2 per cent. Companies pay old age pension and war pension tax only of the so-called fund income.

2. DUTIES

Of the great many duties in the Norwegian tax system only the most important can briefly be discribed in this summary.

Customs duties are only collected from imports. The customs tariff has partly spesific rates, partly are the commodities treated on an ad valorem basis. Total Custom receipts amounts to a little more than 5 per cent of the total value of imported goods (ships excepted).

General sales tax is a peculiarity of the Norwegian tax system. The rate is 10 per cent of the retail price, the general sales tax inclusive, and the tax is collected from the retailer. In accordance with the tax enactments the tax must be paid from all kinds of goods (in a very wide sense) except from goods sold to people selling goods of the same sort or using goods of the same sort for raw material or semi-manufactured goods in their production. Previously goods delivered for the building industry (except machines) were exempted from the general sales tax, but from 1955 on this kinds of goods are also subject to taxation. Remedies for production are mostly not subject to taxation, but fuel for transportation is taxed. If anyone imports goods, and this kind of goods in domestic purchase would be subject to taxation, he must pay general sales tax on the imported goods.

Duties on alcohol in force are as follows:

The production of spirits is taxed by kr. 4,72 per liter 100 per cent alcohol.

Production of beer is taxed according to the alcohol percentage: Up to 2,5 per cent (i.e. per cent of valume) alcohol kr. 0,30 per liter, 2,51—4,75 per cent alcohol kr. 1,17 per liter, 4,76—7,0 per cent alcohol kr. 1,90 per liter.

> Spirits for drinking purposes sold from stores (special stores owned by the state) is subject to a duty of 25 per cent of the sales amount (duty included).
>
> Spirits for drinking purposes sold from stores is subject to an additional excise of 150 per cent of the retail price, for heavy wines the duty is 100 per cent and for weak wines 50 per cent. Liqueur which is served is correspondingly charged with a duty of 75 per cent. For beer served at restaurants one must pay from kr. 0,77 to kr. 1,14 per liter (graded according to alcohol contents).

Duties on tobacco are charged on all tobacco products, cigars, cigarettes, cigarette paper, smoking tobacco and chew tobacco. The duties are graded so that more expensive qualities are taxed heavier than cheaper qualities. For example, duty on Cigarettes varies from 8,65 kr. per 100 to 17,40 per 100.

Duties on chocolate and sweets are chargeable at following rates (percentage of the wholesale value of the goods):

> cocoa powder 20 per cent, chocolate tablets 50 per cent and other kinds of chocolate and sweets 120 per cent.

Duty on gasoline is kr. 0,18—kr. 0,32 per liter gasoline omported or manufactured within the country. For cars not using such fuel, duties are based on the weight of the cars.

Other duties deserving mentioning, are the following excise on the conveyance of registered motor vehicles, excise on carbonated non-alcoholic beverages (kr. 0,30 per liter), duty on matches, on ice cream (1 kr. per liter), tax on motor vehicles (paid yearly as long as the car is in use), excise on electric power (kr. 0,02 per kWh), entertainment tax, tax on money gambling, stamp duties on documents and playing cards, duties on „certain" goods (platinum, gold- and silver-products: 50 per cent, personal jewelry and objects for decoration: 50 per cent, silk articles: 10 per cent, cosmetic toilet-articles: 60 or 30 per cent).

As previously mentioned receipts from some duties are not booked in the state budget accounts. Important examples are price regulation duties paid to independent funds administered by the Price directorate. The price regulation funds have been used for these purpose: a) confiscation of conjuncture income or other extraordinary income, for instance export income which may be a result of the fact that domestic price level is kept low by subsidies to Norwegian articles of consumption, b) subsidizing certain commodities — for example important articles of consumption, c) a levelling of prices on commodities bought in different markets or at different times in the same market, d) a grading of prices according to the purpose for which the goods are intended, e) a levelling of transportation costs.

3. SOCIAL SECURITY PREMIUMS

The Norwegian system of social insurance has grown up during the last two generations under varying conditions. The system as it now exists therefore presents a somewhat heterogensious picture. Social security agencies raise revenue from three main sources; individual premiums, employers contributions and transfers from other branches of government. In this publication the different insurance schemes are divided into three groups:

a) The first group contain insurance schemes under which the premiums are paid by individual members, for pension insurance for state employers and accident insurance for fishermen.

b) The second group contains insurance schemes under which the premiums partly are paid by individual members, and partly by employers. The two most important insurance plans in this group are health insurance and unemployment insurance. (From 1959 also old age pension insurance can be classified in this group.) The health insurance scheme nearly covers all permanent residents of Norway. Members are divided into two main tariff groups, employees and other members. In both tariff groups individual premium are graded by size of income. In addition, employers pay 60 per cent of the employees' premium, local authorities 22 per cent of all members' premium and the central government 20 per cent. — Broadly all employees who are liable to compulsory health insurance are also members of the unemployment insurance scheme, where premiums are also graded by the size of the members income. Unemployment insurance premiums are divided equally between employers and employees.

c) The last group of insurance schemes contain insurances under which the premiums are paid by employers only, for example some of the accident insurance schemes. Premiums under the industrial accidents scheme are paid by employers only. Premiums are calculated on the basis of technical insurance principles. At present all industrial undertakings are divided into 17 classes of danger risk, with particular premium rate in each class.

LE SYSTEME FISCAL DE LA NORVEGE EN 1958

par OLAV HAUAN

RÉSUMÉ

L'article ci-dessus traitant du système fiscal norvégien de 1958 est basé sur un exposé élaboré par le Bureau Central des Statistiques norvégien. Il donne des précisions sur: 1) l'impôt sur le revenu et l'impôt foncier, 2) les Droits et 3) les primes de Sécurité Sociale, d'après la situation de 1958. Depuis que l'article a été rédigé sont intervenus quelques ajustements. Au lieu de déduire les diverses dépenses, les salariés peuvent maintenant retrancher 8 % (précédemment 6 %) du salaire comme déduction normale. La déduction normale maximum est maintenant 1500 Nkr. (précédemment 1000 Nkr.) et la déduction minimum 500 Nkr. (précédemment 200 Nkr.). Les contribuables mariés peuvent maintenant choisir d'être imposés séparément ou ensemble. On a aboli l'impôt sur les capitaux des sociétés. On a créé un système d'impôt provisionnels.

Du point de vue administratif, on peut diviser les impôts en 2 groupes, les impôts perçus par le gouvernement central et les impôts perçus par les municipalités. Les impôts du gouvernement central peuvent de plus être classés en impôts figurant sur les comptes budgétaires (le budget d'Etat norvégien n'inclut pas toutes les recettes et les dépenses de l'Etat), les impôts des „fonds" publics et les impôts des organismes de Sécurité Sociale.

Actuellement, les impôts foncier et sur le revenu sont:

Impôts d'Etat:

— Impôt ordinaire sur le revenu,

— Impôt sur les réserves,

— Impôt pour la vieillesse et les combatttants.

Impôts municipaux:

— Impôt ordinaire sur le revenu,

— Impôt foncier,

— Surtaxe sur les hauts revenus.

THE INCIDENCE OF TAXES AND PREMIUMS FOR SOCIAL INSURANCE ON FAMILY BUDGETS 1)

by R. BANNINK

Centraal Bureau voor de Statistiek, Den Haag

I. Theoretical aspects.

1. *Introduction.*

Until now the incidence of taxes on individuals has been made subject to ethical and juridical studies rather than to economic ones. Micro-economic theory has shown a great interest in taxation problems, e.g. the influence of taxes on the volume of output, on the supply of labour and the transfer of incidence. Macro-economic investigations concern either these problems in aggregate version or fiscal policy in general. But macro-economic data only refer to a relation between taxes and individuals by some amount per capita. And often investigators conclude on this small basis to a difference in the incidence of taxes between some years or between some countries.

Moreover, the ressemblance between taxes and charges of social security — existing from the individual point of view — has been overlooked in many of these comparisons. It is evident that both charges should be added in comparing the incidence on families living in different countries because of the shifts in boundaries between tax and social insurance premium.

This article will try to indicate the disadvantage of the macro-economic comparison of individuals' tax incidence in respect of the micro-economic way (para. 2). Furthermore the scope of such a micro-economic analysis will be investigated in para. 3 and — after

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1) This article is based upon a study into the Dutch figures, made by the author at the Netherlands Central Bureau of Statistics. The results of this study have been published in the 2nd and 4th quarter 1959 of the C.B.S. journal "Statistische en econometrische onderzoekingen", Publisher: W. de Haan, N.V. Zeist (Netherlands). The author is indebted to Mr. W. H. Somermeijer for his comments after reading the manuscript and to the Director of the C.B.S., who allowed to reprint here some tables from the publications mentioned above.

a general introduction into the system of taxation and social insurance and general suppositions (para. 4—5) — the methods of measurement will be explained in para. 6. Para. 7 summarizes the statistical requirements and the suppositions to be made. Finally a summary will be given in para. 8 and some hypotheses will be generalized in appendices.

A second article will provide a practical example: the tax incidence on Dutch families.

2. *A comparison between micro- and macro-economic analysis.*

The macro-economic way of comparing tax incidence between countries or between years is to measure either the amount of taxes per capita or its ratio to the amount of national income per capita. Doing so one is making many suppositions which cannot be expected to obtain always. For example, the distribution of personal income wil not be similar to that of taxes paid by its earners. So conclusions based on averages do not apply to special income groups. Moreover a heavy tax on enterprises will be regarded equal to a sharp progression in income tax. Nor will the differences in the share of profits, retained by enterprises be taken into account in spite of the understatement of the tax incidence on individuals in consequence of the adding up of these shares in national, but not in personal income. These amounts or ratios give but suggestions, however, they can be computed in an easy way from data already available.

The micro-economic way avoids these biases. Herewith a family type is chosen — under detailed description of its size, income class, occupation of the head of the family and so on — and the average incidence of taxes and social insurance premiums on this category of families is to be computed. The gain of this way of analysis is that a kind of family-type can be chosen serving at best the goal of the comparison. The loss is the time, wasted in computations. But in many respects the results of this micro-economic analysis will be simultaneously applicable, e.g. in moulding a guiding model for fiscal authorities, adding a set of wanted figures to market analysis etc.

3. *The scope of the study.*

Each analysis needs a conscientious description of its scope. So in this paragraph the conceptions family, tax, social insurance and incidence has to be defined.

3. 1 A family can be defined as a married couple, living together with their children, if any, parents or other relatives, pooling their income and expenditures.

So boarders and domestic staff do not belong to the family. Relatives not pooling their income are to be treated as boarders.

3. 2 Tax is every amount due to the central government or other public authorities (viz. provincial and local authorities) without a related government commitment to supply a special good or service to the taxpayer personally.

So lockages, schoolfees and so on have been left out of account. Levies, due to the Executive Bodies of the Public Industrial Organization serving the financing of activities, influencing market prices are included. Subsidies should be regarded as negative taxes and eventually balanced with related levies.

3. 3 Social insurance consists of insurances, ordered by law or by other governmental decisions or by entrepreneurial statutes.

With respect to the latter group a limitative definition should be applied. The guiding principle should be the criterion whether a family within the chosen group may avoid that insurance without taking exceptional measures like emigration or changing one's job.

3. 4 The incidence of taxes and of social insurance premiums on family budgets should be defined as the average amount of the sum-total of both charges, paid by the family directly or indirectly.

The indirect charges will result from increase of costs on behalf of taxes charged primarily to entrepreneurs, which increase is assumed to be totally transferred to consumers.

This is the absolute way of defining incidence, the relative incidence is the ratio of this amount to the family income.

In choosing the family types one can be guided by the mode of the marking facts (income, family size etc.) or by special constraints from any other resource.

4. *The system of taxation.*

Two main groups are to be distinguished in each system of taxation:

a. Taxes which are to be paid by individuals. Their amount due is based on income, wealth, size of heritage or on the possession of items like a car, a dog etc.

b. Taxes which are to be paid by enterprises. Again two subgroups may be distinguished: (1) taxes, based on the total amount of profit and (2) taxes based on total amount of turnover, salaries and wages or on possession of trucks, buildings, land etc.

The system of social insurance varies from one country to another, but within the limits of its definition both groups mentioned above will appear:

a. The premiums paid by families, mostly as a percentage of income and sometimes as a fixed amount per capita, and
b. the employers-contributions, nearly always depending on the amounts of wages and salaries (cf. taxes group b (2)).

Group a. will be called direct taxes (premiums), group b. (2) indirect taxes (premiums).

5. *The supposition of transfer of taxes.*

It is evident that the incidence of direct taxes and premiums falls on those who pay them, but whether the same applies to other charges is questionable.

As regards corporation-tax (b(1)) it is generally accepted that this tax is borne by the corporation only, hence reducing the income of the enterprises and the receivers of dividends. One has tried to demonstrate the possibilities of passing its incidence on to the corporation's customers, i.e. ultimately to the consumers. [2]) Appendix I will prove that such is impossible. Hence it can be left out of consideration, since the analysis is based on family income without any regard to the size it might have had if some tax might not have been levied or some grant might not have been paid. The indirect taxes can be transferred to customers and suppliers alike, just as the price elasticities for the supply and demand of the enterprise will be. For simplicity's sake the total incidence of indirect taxes is supposed to be passed on to customers and finally to consumers. In appendix II it will be shown that this will be nearer the truth than any other solution.

6. *The patterns of incidence and their consequences for measurement.*

6. 1 Direct taxes and premiums. Knowing the tax basis

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[2]) Brück, Dr. J.: „Die Körperschaftsteuer als Kostenfaktor", Finanzwissenschaftliche Forschungsarbeiten; herausgegeben von Prof. Dr. G. Schmölders, Universität Köln.

one should determine its size for the family group taken into consideration. When this basis is income, statistics of income are needed, where it is a number of cars one has to compute the average number of cars, possessed by families belonging to that group and so on.

Sometimes these procedures will meet insurmountable difficulties, in which case either one or some modifications from the family-description might be suspended or estimates are to be made.

6. 2 Indirect taxes and premiums. The incidence of this group is directly tied up with the composition of the family's budget. Hence one has to compute the total percentage of indirect taxes in the consumer prices of the budget items. This being done, the cumulated products of this percentage and the expenditures will give the absolute incidence of indirect taxes.

The tax-percentage in the consumers price of any budget item is computed by adding the amount due by the last phase of production (retailtraders) to those due by the preceding phases of production. Hence not only the taxes levied on the product itself, but also those levied on its factors of production are contributing to the ultimate incidence on the consumer.

According to the phase in which they enter the production process from initial goods to consumers products, the indirect taxes show three patterns by which their incidence passes to the consumers: The method of going backwards in the production process will be called the retrograde method. It may be applied in case the contributions of the stages of production farther away are diminishing rapidly. The share of stages lower than the last three will make such a meshwork that it might be impossible to trace it statistically. Here we come to the second group of indirect taxes: those who have been levied especially in the lower stages of production, [3]) or whose amounts, levied in these stages, are too important to be neglected — as is done by the retrograde method.

Professor Tinbergen avoided this neglection by computing the amount of taxes on any product as the limit-sum of an infinite geometrical sequence, assuming that the profit-rate and tax-rate will be the same for all stages of production. However, there is a more realistic method for computing the total amount of this kind of taxes per family.

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[3]) The used ranking in the production process: high (last) — low (first) makes the retailers high (last) and producers of initial goods (mining, agriculture) lowest (first) stage in production.

In Statistical Studies, no. 6 (November 1955), the Central Bureau of Statistics in the Netherlands published an analysis of cumulated cost-ratios for the Netherlands economy in 1950. This method — called the matrix method — is based on an input-output table as provided by the National Accounts. To put it shortly — for technical details referring to the publication mentioned above — all intermediate costs, appearing as sales by one branch of industry to another, have been broken down into final costs. Taxes belonging to this second sub-group form a final cost category. The results of the pertinent computations are cumulated cost-ratios per branch of industry. These cannot be tied up directly with the family's budget, firstly since the latter is not split by branch of industry but by item of expenditure, secondly because consumption also includes imported goods, which have other tax-ratios (except custom duties equal to zero) than the domestic products. Taking the percentage of imports and of home-produced goods as weights per branch of industry an average can be computed for the percentage of taxes on imports and the cumulative ratio of taxes to domestic products. These average percentages, multiplied by the family's expenditures grouped according to industrial branch of production, give the absolute incidence of the tax taken into consideration.

The last group of indirect taxes consists of those whose revenue is so small that it is not worthwhile to use one of the foregoing methods. Or thus may not be directly tied up with a specific stage in the production process. The most simple way of estimating their incidence on household expenses is allocating their total revenue to households or persons concerned according to total expenditures or expenditures on food or some other rule of thumb.

The indirect premiums should be considered in the same way as the second group of indirect taxes, because employers' contributions have been levied throughout the process of production.

7. *The statistical requirements.*

In the foregoing paragraphs various statistical requirements have been mentioned or were assumed to be met. This paragraph will give their main outlines.

a. In choosing the specific types of family, their income- and expenditure-pattern has to be known, i.e. the results of a budget enquiry have to be available. The determination of family types is restricted by the grouping, applied in this budget enquiry.

It may be that no budget enquiry of the proper year is available, as was the case with the study on tax incidence on Dutch households. In that case an earlier budget enquiry may serve the study under the assumption that the nominal pattern of expenditures has not changed for a particular group of families, nor did their income. It is also possible to compute the changes by estimating income and price elasticities for all budget items separately or by groups, but it is very doubtful whether the results justify all the work to be done.

An alternative assumption is to expect no changes in the quantitative pattern of expenditures — if figures are available. The choice between these alternatives should depend on the basis of taxation: in case of ad-valorem duties the former has to be chosen, while the latter can be applied, when some quantity makes the basis of assessment.

b. The retrograde method requires a detailed insight into the structure of costs of production and trade margins of all the budget items. For this purpose statistics of industrial production and trading are indispensable.

c. The system of national accounts has to be developed as far as possible to derive an input-output table. If such a table is not available for the proper year an earlier one may be used — all entries representing percentages instead of absolute amounts — unchanged structure of production being assumed. Per industrial group total output and amount of taxes have to be estimated for the year concerned, because their ratio makes the non-cumulated costquota.

The general assumption underlying the use of the matrix method is that each good delivered by some industrial group has the same coststructure as any other product of that group. Moreover, the relative shares of imported consumer-goods computed by groups of industry cannot be detailed. So one has to assume that the quota of imported goods in total expenditure will be the same for all types of family.

8. *Summary*.

This article enunciates a micro economic analysis of the incidence of taxes and premiums of social insurance on families. It may possibly stimulate investigators in other countries in making such analyses. A subsequent article will show a practical example, based on Dutch figures. For purposes of comparing internationally the legal incidence on family budgets or guiding fiscal authorities in building their system of taxation, these analyses may give a better basis than the macro-economic ones, used up till now. This notwithstanding the various assumptions which should be made at the computations.

Appendix I. Is a corporation tax, based on total profit, to be transferred?

Suppose the total production in an industry is x units and their price will be dependent on their total supply, so $p = f(x)$. The industry's revenue is consequently $x\, f(x)$.

Further supposition is that total production costs for this x units are also dependent on this quantity: $= g(x)$.
So gross-profit will be $y = x\, f(x) - g(x)$.
There is levied a corporation-tax at a rate of 100h % of gross-profit, in which h is a function of y, so $h = h(y)$.

When it is possible to prove that a change in h will not have any influence upon the quantities of demand and supply in a partial equilibrium, it will also be proved that this h has not any cost-price rising influence, which could have been transferred to an industry's customer.

The last supposition which is required is that the entrepreneur tries to maximise his net-profit (so profit after tax). In that way of enterprising is

$$\frac{d}{dy}\left[\{1 - h(y)\}\, y\right] . \frac{dy}{dx} = 0, \text{ or}$$

$$\left[1 - h(y) - y . \frac{d\, h(y)}{dy}\right] . \frac{dy}{dx} = 0.$$

When a product equals 0, than one of its factors must equal 0,

so either $\frac{dy}{dx} = 0$ (1)

or $1 - h(y) - y \frac{d\, h(y)}{dy} = 0$ (2)

In the case that (1) prevails, the entrepreneur appears to have the same policy as if he maximised gross-profit, so irrespective of the value of h.

Is (2) prevailing, then

$$1 - h(y) = y\frac{d\,h(y)}{dy} \quad \text{or}$$

$$\frac{dy}{y} = -\frac{d\,h(y)}{h(y) - 1}. \text{ Integration will give}$$

$$\ln y + c = -\ln\{h(y) - 1\} \quad \text{or}$$

$$\ln y\,e^c = \ln\{h(y) - 1\}^{-1}, \text{ so}$$

$$y\,e^c = \{h(y) - 1\}^{-1}, \text{ The solution for } h(y) \text{ will be}$$

$$h(y) = 1 + (ye^c)^{-1}$$

As $(ye^c)^{-1}$ is a positive value, the consequence of (2) should be that $h(y) > 1$. This does not satisfy the economic sense of $h(y)$, as a tax-rate more than 100 % is nonsense. Nobody would produce anything in such circumstances. Thus possibility (2) does not satisfy and is resting (1), in which case has been proved — assuming the maximisation of profit — that h has not any influence on x nor on $f(x)$.

Appendix II. The influence of an indirect tax on the market price. 4)

A. *Perfect competition among suppliers.*

Let us have a supply-function $S = f(p)$ and a demand-function $D = g(p)$. Under condition of partial equilibrium $S = D$ at a price $p = p_0$.

Assuming an indirect tax t will be levied we have to rewrite S as follows: $S = f(p - t)$. The new equilibrium is settled for ,
$f(p - t) = g(p)$.

Suppose f can be differentiated and b is relative small in respect of p, than an approximation by a Taylor-series gives
$f(p) - t\,f'(p) = g(p)$.

This relating to the starting-point $f(p_0) = g(p_0)$ leads, by a second Taylor-series aproximation, to

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4) This appendix is fully derived from "Statistische en economische onderzoekingen", 2nd quarter '59, appendices I and II, which have been written by Mr. W. H. Somermeijer.

$$f(p_0) + (p - p_0)f'(p_0) - t\{f'(po_0) + (p - p_0)f''(p_0)\} = g(p_0) + (p - p_0)g(p_0).$$

Neglection of $t(p - p_0)f''(p_0)$ — which is allowed in the case of a small curvature of the supply-curve and/or relative small t — leads to the following solution for p:

$$p = p_0 + \frac{t\,f'(p_0)}{f'(p_0) - g'(p_0)} = p_0 + \frac{t\,E_0}{E_0 - N_0}.$$

$E_0 = \frac{p_0}{S_0} f'(p_0)$ is the elasticity of supply and

$N_0 = \frac{p_0}{D_0} . g'(p_0)$ is the elasticity of demand, both in respect of the price.

The conclusion is that by $E_0 \to \infty$ and/or $N_0 \to 0 : p = p_0 + t$ which means that by perfect elasticity of supply and/or perfect inelasticity of demand, respectively $E_0 \to 0$ and/or $N_0 \to \infty : p = p_0$, the incidence of an indirect tax will weigh upon the consumer respectively the supplier.

B. *Supplier's monopoly.*

Assume the monopolist tries to maximise his profit, adapting his prices to the demanded quantities. Denote the price by p, the unit-costs (excluded tax) by c, the demanded quantity by D and the profit by P, then is $P = D(p - c)$. This has to be maximised under the side-relations $D = g(p)$ and $c = c(D)$.

Substitution will lead to

$$P = g(p)\,[p - c\{g(p)\}] = 0.$$

The necessary condition for maximisation is

$$\frac{dP}{dp} = g(p)\,[1 - \frac{dc}{dg}\,g'(p)] + g'(p)[p - c\{g(p)\}] = 0.$$

For $p = p_0$ has this condition to be satisfied, so

$$g(p_0)\,[1 - \frac{dc}{dg}\,g'(p_0)] + g'(p_0)\,[p_0 - c\{g(p_0)\}] = 0.$$

The profit-function is in case of an indirect tax (t) $P = D(p - c - t)$ or similar to the foregoing derivation, $P = g(p)[p - \{g(p)\} - t]$, with necessary condition for maximisation

$$\frac{dP}{dp} = g(p)\left[1 - \frac{dc}{dg}g'(p)\right] + g'(p)\left[p - c\{g(p)\} - t\right] = 0.$$

Taylor-sequences, broken up at the first derivatives, lead again to

$$\frac{dP}{dp} = \{g(p_o) + (p - p_o)g'(p_o)\}\left[1 - \frac{dc}{dg}g'(p_o)\right] + $$
$$+ g'(p_o)\left[p - c\{g(p_o)\} - (p - p_o)\frac{dc}{dg}g'(p_o) - t\right] = 0.$$

Substituting the relation, developed without regard of any tax from $dP/dp = 0$, running in p_o, leads to

$$p \cong p_o + \frac{t}{2\left[1 - \frac{dc}{dg}g'(p_o)\right]}$$

$\frac{dc}{dg}$ being 0, this means unit-costs are independent of demand, this expression for p would turn into $p = p_o + \frac{1}{2}t$, so monopolist and customer would pay an equal part of tax each.

According to the sign of dc/dg (positive resp. negative) the customer's part into tax incidence varies. ($g'(p_o)$ is assumed to be negative, viz. demand decreases for rising prices.)

II. A practical example: Tax incidence in the Netherlands.

1. *Introduction.*

The theoretical aspects of a micro-economic analysis of the incidence of taxes and social security premiums having been considered, [5] a practical example will elucidate the details and the kind of difficulties which have to be conquered. This example is an abbreviation of a study made by the author at the Central Bureau of Statistics in the Netherlands. ⁶)

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[5] Viz. I: Theoretical aspects.

A description of the scope of this study will be given in para. 2, and some further details concerning the system of taxation in the Netherlands in para. 3. Consequently the stock of statistical data available (para. 4) will be compared with that required in order to get an insight into the suppositions to be added (para. 5).

In para. 6 the main results of this study will be presented. A summary (para. 7) concludes this article.

2. *The scope of the Dutch study.*

The goal of the study into Dutch figures was to compare tax-incidence between years and between various types of households in order to assess the influence of income, family-size, occupational status etc. on this incidence. The scope of this study is rather wide: For one type of family two year-data and for one year data of six family types. In order to obtain figures with a high degree of social interest the modal values of characteristics describing the family-type have been chosen — as far as distinguished in the budget enquiry (see para. 4) Table 1 shows the result of this choice.

As reference dates the first of January 1954 and the first of January 1956 were chosen. However, it appeared to be impossible to avoid using annual averages in a number of instances.

A comparison in time (between 1954 and 1956) was made with respect to family-type B; the influence of family size and of family income is derived from the results for family types A, B and C and types D, E and F respectively. Finally a comparison between B and D figures indicates the influence of occupational status on the incidence of taxes and premiums for social insurance on families.

3. *The system of taxation and of social insurance in the Netherlands.*

3.1 General remarks. In the Netherlands taxes are levied by the Central government, provincial and municipal authorities, waterboards and executive bodies of Public Industrial Organization.

The facts underlying the amount due to these authorities

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⁶) "Statistische en econometrische onderzoekingen", 2nd and 4th quarter 1959 (with English summary).

could be found in the budget enquiry as they are either economic ones (income, purchases etc.) or important social ones (number of children). Instead of this, in social respect general, taxation, the incidence of social insurance is much more diversified according to specific social facts (e.g. kind of job) which were of no interest for the budget enquiry. Hence the figures concerning tax incidence and those concerning the incidence of premiums for social insurance have not been added, but published separately, the margin of uncertainty being larger in respect of the latter than of the former.

3. 2 Direct taxes. The most important direct tax is the income-tax, dependent on marital status, number of children, family allowances and of course on the amount of income.

Taxes of less importance are the inhabited property tax (based on rent or rental value of the house and on the value of furniture) and the general property tax. The latter was not relevant in this study since the family-types taken into consideration are not assumed to possess assessable property as was born out by the results of the budget-enquiry. In addition there are death duties and dividend tax. An ambiguous category is the motorvehicle tax, as it may be considered as a direct tax when charging individuals and as an indirect tax when charging enterprises. Its amount due depends on technical characteristics of the motorvehicles such as weight, kind of motor, kind of tyre etc.

3. 3 Indirect taxes. According to the criteria, developed in para. 6 of the foregoing article, the indirect taxes are distinguished into three groups.

a Taxes to which the retrograde method is applied: turnover tax, excise duties (except excises on motor spirit for industrial activity, whose incidence is computed by the matrix method) and levies and subsidies, partly under control of the Central Government, partly originating with the executive bodies of Public Industrial Organization.

b The taxes, computed by the matrix method are custom duties, motorvehicle tax, levies equalizing the burden of childrens' allowances, the above mentioned part of excises and the total indirect taxes incorporated in the costs of using capital goods.

c The remaining indirect taxes are rent-subsidies, entertainment tax, taxes on land and various small provincial and municipal taxes. This group's incidence is distributed according to some rule of thumb, e.g. among all items, or on all food items on the basis of expenditures of an fixed amount per capita or per family.

3. 4 Premiums for social insurance. The premiums chargeable to individuals have been computed as a percentage of their assessable income. This does not imply that social insurance premiums are always paid as percentages since within each family-type persons with certain characteristics may be exempted, e.g. public servants among the clerical employees in the case of sickfunds-insurance. The percentage computed is merely an average for the entire family type, in which also the exempted groups have been included.

The indirect premiums, i.e. employers' contributions, have been traced by the matrix method. Their amounts per group of industry could be derived directly from the national accounts for the Netherlands.

4. *The statistical data available.*

It is clear that a limitative enumeration of the statistical data used should resemble sawdust in the mouth. Only the main outlines will be mentioned here.

One of the sources for data is the budget enquiry. No such data were available for the years considered, the latest referring to 1951. The latter has been used, which implied some additional assumptions (see next paragraph).

Various production statistics, key-numbers etc. concerning trade and industry have been used in connection with the retrograde method. The national accounts for the Netherlands provided an input-output table for 1954. This table has also been applied for 1956 after having been transformed from absolute to relative amounts — relative in respect of the total output per group of industry. Moreover the national accounts have been used in various computations.

5. *Additional assumptions.*

Two statistical devices are needed to add some important suppositions to the general ones, explained in the foregoing article.

With respect to the use of data from the budget-enquiry 1951 in computations relating to 1954 and 1956 figures it is evident that the families covered by the budget enquiry in 1951 will not show the same income and expenditures in 1951 or in 1954, since wage increases and changes in relative prices have taken place. The expenditure-pattern of these families has changed according to their income- and price elasticities. There is but little information about these elasticities. Moreover, the "real" expenditures per family could hardly be approximated even with this information. On the other hand, one could consider families showing the same expenditures in 1954 (1956) as the families enquired in 1951, except the amount due to direct taxes. Changes in the latter amount are supposed to influence only the amount of savings.

Finally the production functions are assumed to be constant from 1954 up till 1956, underlying the application of the 1954 input-output table to 1956 with a view to the shortness of the period in between.

6. *Results*.

Whereas the foregoing paragraphs stress the need for caution in interpreting the results of the analysis, the following conclusions can be drawn from table 2:

Intertemporal comparison. The total tax incidence decreased from 1954 to 1956, mainly because of the reduction in the rates of income tax and of turnover tax (see for results per tax-category table 3). The same holds for the incidence of the social insurance premiums, although this decrease was less grave than the former.

Comparison between family size groups. The incidence of direct taxes (in proportion to income) decreases strongly and that of indirect taxes slightly with increasing size of family. With respect to the incidence of social insurance premiums the direct premiums show a small increase, the indirect ones a stronger decrease with increasing size of family.

Comparison between income classes. Indirect taxes are about proportional to (increasing) income, while direct taxes rise more rapidly. Up to the income-limit of welfare (above which no direct premiums are due) total incidence of premiums is proportional to income. When income exceeds this limit the direct premiums' incidence shows a sharp decline, since above this limit pension-premiums are the only constituants.

No significant difference, neither in the tax-incidence nor in that of social insurance preimiums has been found between the families of manual workers and clerical workers — having the same income and family size.

Table 3 shows the results in detail, table 4 highlights the burden on food expenditures. These figures are self-evident. For more details one should consult the publications on the Central Bureau of Statistics in the Netherlands, mentioned in the Introduction of this article.

Table 1

COMBINATIONS OF CHARACTERISTICS, DESCRIBING FAMILY-TYPES.

<table>
<tr><td>Family-size</td><td>2</td><td>4</td><td>6</td><td colspan="3">4</td></tr>
<tr><td>Income-class</td><td colspan="3">ƒ 3.000,— ƒ 4.000,—</td><td colspan="3">ƒ 5.000,— ƒ 8.000,—
ƒ 6.000,— ƒ 12.000,—</td></tr>
<tr><td>Occupational group of the head of the family</td><td colspan="3">Manual workers</td><td colspan="3">Clerical workers</td></tr>
<tr><td>Code</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr>
</table>

Table 2

ABSOLUTE AND RELATIVE INCIDENCE OF TAXES AND PREMIUMS FOR SOCIAL INSURANCE, PER FAMILY-TYPE, 1954 AND 1956.

Family-type	B	A	B	C	D	E	F
Year	1954	1956	1956	1956	1956	1956	1956
	In guilders						
Taxes							
Direct taxes	51	154	7	6	42	245	972
Indirect taxes	257	168	166	162	168	278	482
Total	308	322	173	168	210	523	1,454
Social insurance							
Direct charges	225	224	217	199	227	345	251
Indirect charges	96	87	95	101	100	136	220
Total	321	311	312	300	327	481	471
	In 0.1 percents of family-income						
Taxes							
Direct taxes	14	45	2	1	11	44	99
Indirect taxes	72	49	46	44	45	50	49
Total	86	94	48	45	56	94	148
Social insurance							
Direct charges	63	65	61	54	61	62	26
Indirect charges	27	25	27	27	27	25	22
Total	90	90	88	81	88	87	48

Table 3.

FAMILY-EXPENDITURES IN 1951 AND THE SHARES OF INDIRECT AND 1956 RATES, AND AMOUNTS OF DIRECT TAXES DUE

Comparison between	Years		Family-sizes			Income-classes		
Family-type	B		A	B	C	D	E	F
Year	1954	1956	1956	1956	1956	1956	1956	1956
	Amount of expenditures in guilders							
Expenditures on goods and services	3,495	3,495	3,174	3,495	3,710	3,632	5,029	8,325
ncluding								
Turnover tax	130	60	59	60	61	66	95	157
Excises	86	87	86	87	88	76	116	156
Governmental levies and subsidies ¹)	—69	—94	—79	—94	—107	—92	—96	—99
P.I.O.-levies and subsidies ¹) ²)	4	4	3	4	5	4	5	6
Custom duties	30	39	34	39	42	41	56	89
Equalization levy	23	25	23	25	26	26	36	60
Motorvehicle tax	8	6	5	6	6	6	8	13
Indirect taxes incorporated in costs of using capital goods	15	15	14	15	16	16	22	35
Entertainment tax	2	2	3	2	1	2	4	11
Miscellaneous indirect taxes	28	22	20	22	24	23	32	54
Total indirect taxes ³)	257	166	168	166	162	168	278	482
Total indirect charges of social in-urance	96	95	87	95	100	100	136	220
Direct taxes ³)	51	7	154	7	6	42	245	972
ncluding								
Income tax	44	—	142	—	—	29	224	910
Individual property tax	5	5	9	5	4	9	17	56
Motorvehicle tax	0.2	0.1	1.1	0.1	0.2	1.0	0.7	1.7
Miscellaneous direct taxes	2.0	2.0	2.1	2.0	1.3	2.5	2.9	4.1
Direct charges of social insurance	225	217	224	217	199	227	345	251
otal income	3,580	3,580	3,442	3,580	3,718	3,730	5,522	9,820

Levies and subsidies have been balanced.

P.I.O. is the abbreviation of Executive bodies of Public Industrial Organization.

Roundings of the entries may have caused deviations between their sum-total and the total-entries.

TAXES AND SOCIAL INSURANCE CHARGES ACCORDING TO 1954 AND 1956 RATES ON 1951 INCOMES.

Occupat. groups		Years		Family-sizes			Income-classes			Occupat. groups	
B	D	B		A	B	C	D	E	F	B	D
1956	1956	1954	1956	1956	1956	1956	1956	1956	1956	1956	1956
		Expenditures in 0.1 percents of income									
3,495	3,632	976	976	922	976	998	974	911	848	976	974
60	66	37	16	17	16	17	18	17	16	16	18
87	76	24	24	25	24	24	20	21	16	24	20
—94	—92	—19	—26	—23	—26	—28	—25	—17	—10	—26	—25
4	4	1	1	1	1	1	1	1	1	1	1
39	41	8	11	10	11	11	11	10	9	11	11
25	26	6	7	7	7	7	7	6	6	7	7
6	6	2	2	1	2	2	2	1	1	2	2
15	16	4	4	4	4	4	4	4	4	4	4
2	2	1	1	1	1	0	1	1	1	1	1
22	23	8	6	6	6	6	6	6	5	6	6
166	168	72	46	49	46	44	45	50	49	46	45
95	100	27	27	25	27	27	27	25	22	27	25
7	42	14	2	45	2	1	11	44	99	2	11
—	29	12	—	41	—	—	8	41	93	—	8
5	9	1	1	3	1	1	2	3	6	1	2
0.1	1.0	1	1	1	1	0	1	1	1	1	1
2.0	2.5										
217	227	63	61	65	61	54	61	62	26	61	61
3,580	3,730	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Table 4

EXPENDITURES ON FOOD IN 1951 AND THE SHARES OF INDIRECT TAXES AND CHARGES OF SOCIAL INSURANCE ACCORDING TO 1954 AND 1956 RATES, IN 0.1 PERCENTS OF FAMILY-INCOME.

Description	Family-type						
	B	A	B	C	D	E	F
	1954	1956	1956	1956	1956	1956	1956
Total expenditures on food including	384	316	384	426	345	287	194
Turnover tax	8	4	4	4	4	4	3
Excises	9	8	9	10	9	7	6
Governmental levies and subsidies 1)	—8	—8	—11	—15	—10	—7	—4
P.I.O. levies and subsidies 1) 2)	1	1	1	1	1	1	1
Custom duties	3	4	4	5	4	3	2
Equalization levy	3	2	3	3	2	2	1
Motorvehicle tax	1	1	1	1	1	1	0
Indirect taxes incorp. in costs of capit. goods	2	1	2	2	1	1	1
Total indirect taxes on food expenditures 3)	19	12	13	12	12	12	10
Total indirect charges of soc. insurance on food expenditures	9	8	10	11	9	7	5

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1) Levies and subsidies have been balanced.
2) P.I.O. is the abbrevation of Executive bodies of Public Industrial Organization.
3) Roundings of the entries may have caused deviations between their sum-total and the total-entries.

LA PRESSION DES IMPOTS ET DES PRIMES DES ASSURANCES SOCIALES

par R. BANNINK

RÉSUMÉ

I. *Points de vue théoriques*

Pour estimer l'influence des caractéristiques diverses des familles, comme le niveau du revenu, la grandeur des familles et la nature de la profession, sur la pression des impôts, une méthode d'analyse micro-économique a été developpée. En ce contexte, les charges des assurances sociales ont été traitées comme des impôts. La pression des impôts est définie comme la relation entre le montant des impôts et le revenu familial avant le payement des impôts (directs).

L'hypothèse principale est que les impôts sur les profits des entreprises ne soient pas transférés, mais que tous les autres impôts sur les entreprises soient complètement transférés aux consommateurs.

Pour mesurer la pression des impôts on distingue les catégories suivantes:

1. Les impôts directs et les primes des assurances sociales contribuées par les employés; la pression de cette catégorie-ci dépend du tarif et de la définition de la base fiscale (par exemple le revenu, la fortune);
2. Les impôts indirects et les contributions des employeurs aux assurances sociales
   - *a.* levés aux dernières étapes du processus de production,
   - *b.* levés aux toutes les étapes du processus de production,
   - *c.* non pas attachés directement aux processus de production ou de peu d'importance.

Pour chaque (sous-)catégorie une méthode spéciale pour mesurer la pression des impôts a été appliquée. En dehors des données diverses les résultats d'une enquête des dépenses familiales, un tableau "input-output" et des coefficients techniques par rapport au processus de production sont indispensables.

II. *La pression des impôts aux Pays-Bas*

L'analyse décrite ci-dessus, appliquée aux données néerlandaises a donné les résultats suivants: